2001 VIRGINIA TOXICS RELEASE INVENTORY (TRI) SUMMARY REPORT

May 2003

TRI

Summary of Data from 2001 Industry Reports

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

This report is published pursuant to Virginia Code § 10.1-1186.1. Direct comparison between figures in this report and figures in past Virginia Toxics Release Inventory (TRI) Summary Reports is discouraged because of changes in reporting requirements and the authorized incorporation of revisions from previous years.

2001 TRI SUMMARY REPORT HIGHLIGHTS

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Chapter 1- General TRI Program Information

WHAT IS THE TOXICS RELEASE INVENTORY?

The Toxics Release Inventory (TRI) is a public database of annually reported toxic chemical releases and management from certain manufacturing or processing facilities as determined by the federal requirement. The TRI was established under Title III, Section 313, of the Federal Superfund Amendments and Reauthorization Act (SARA), which is also known as the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA). The inventory was established to provide information to the public about the presence and release of toxic and hazardous chemicals in communities. From its inception, the TRI program has been expanding and evolving. As part of the Pollution Prevention Act of 1990, TRI was expanded and facilities were required to report additional waste management and pollution prevention activities. In 1995, 286 chemicals and chemical categories were added to the reporting requirement, and in 1998, seven additional industry sectors became subject to reporting requirements. In 2000, seven chemicals and two chemical categories were added to the TRI chemical list. Most of the added chemicals were persistent bioaccumulative toxins (PBT) that are stable for long periods of time and build up in the environment. In addition, the reporting thresholds were lowered for a subset of PBT chemicals. In 2001, lead and lead compounds were designated as PBTs and their reporting thresholds were lowered to 100 pounds per year. Currently the reportable TRI chemical list contains over 600 individually listed chemicals and 30 chemical categories.

Certain manufacturing or processing facilities that produce, process, or otherwise use a TRI chemical in excess of a specific threshold level must report TRI information to the U.S. Environmental Protection Agency (EPA) and to the state in which the facility is located. Since the inception of the program, the Department of Environmental Quality (DEQ) has received and compiled TRI data from facilities in Virginia and published the information in an annual TRI report. Data for all reporting years are available to the public from the DEQ's SARA Title III office. Data for the current (2001) reporting year can be accessed at http://www.deq.state.va.us/sara3/313.html.

WHAT IS REPORTED?

For a chemical or chemical category to remain on or be added to the TRI list, it must be known to cause or reasonably be anticipated to cause one of the following: adverse acute health effects at significant concentration levels beyond facility boundaries as a result of continuous or frequently occurring releases; cancer in humans; or a significant adverse effect on the environment because of its toxicity and persistence in the environment. The TRI was designed to be a program that would evolve, over time, to meet the changing needs of an informed public. Thus, as new chemicals of concern are identified they will be added. Conversely, TRI chemicals that are found not to meet the toxicity requirements can be delisted.

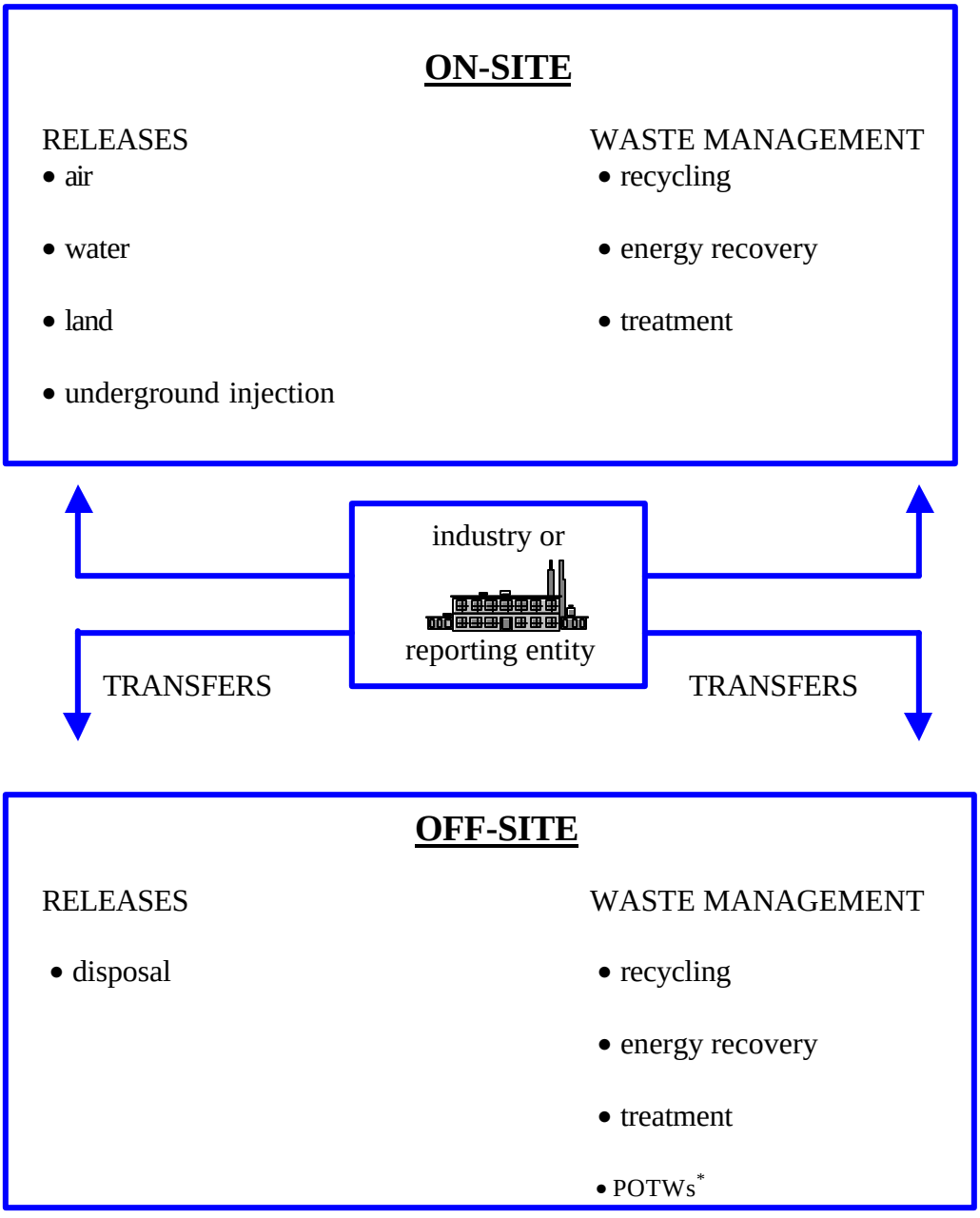
Each year, affected or regulated facilities report:

- the amount of toxic chemicals released on-site to the air, bodies of water, land, and/or underground injection.
- the locations of off-site transfers and the amounts of chemicals transferred off-site for recycling, energy recovery, treatment, and disposal.
- production-related waste management information on quantities recycled, combusted for energy recovery, treated, or released or otherwise disposed of, both on- and off-site, and other one-time releases; and methods used in these treatment activities.

- information such as facility name, physical location, contact information, facility permit numbers, and name of parent company.
- on-site uses of the chemical, maximum amounts stored, and methods used to treat waste streams containing the chemical.

INFORMATION COLLECTED UNDER TRI

The flow chart shown below describes information collected for TRI chemicals (releases to media and options for waste management). Facilities that meet the reporting requirements must report their releases and transfers both on- and off-site.



*Publicly Owned Treatment Works

WHO REPORTED IN 2001?

Any facility that meets the following requirements must report:

1) **It has ten or more full-time employees** (a combined total for all employees of 20,000 hours or more for the year).

2) **The facility's primary business is included in the Standard Industrial Classification (SIC) codes listed below**:

- **10** Metal Mining (except 1011, 1081, and 1094)
- **12** Coal Mining (except 1241)
- **20** Food and Kindred Products
- **21** Tobacco Products
- **22** Textile Mill Products
- **23** Apparel and Other Finished Products Made from Fabrics and Other Similar Materials
- **24** Lumber and Wood Products, Except Furniture
- **25** Furniture and Fixtures
- **26** Paper and Allied Products
- **27** Printing, Publishing, and Allied Industries
- **28** Chemicals and Allied Products
- **29** Petroleum Refining and Related Industries
- **30** Rubber and Miscellaneous Plastics Products
- **31** Leather and Leather Products
- **32** Stone, Clay, Glass and Concrete Products
- **33** Primary Metal Industries
- **34** Fabricated Metal Products, Except Machinery and Transportation Equipment
- **35** Industrial and Commercial Machinery and Computer Equipment
- **36** Electronic and Other Electrical Equipment and Components, Except Computer Equipment
- **37** Transportation Equipment
- **38** Measuring, Analyzing, and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks
- **39** Miscellaneous Manufacturing Industries
- **4911** Electric Services (only facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce)
- **4931** Electric and Other Services Combined (only facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce)
- **4939** Combination Utilities, Not Elsewhere Classified (only facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce)
- **4953** Refuse Systems (only facilities regulated under the RCRA Subtitle C, 42 U.S.C. Section 6921 et seq.)
- **5169** Chemical and Allied Products, Not Elsewhere Classified
- **5171** Petroleum Terminals and Bulk Stations
- **7389** Business Services, Not Elsewhere Classified (only facilities primarily engaged in solvents recovery services on a contract or fee basis)

3) **The facility manufactured, processed, or otherwise used a reportable toxic chemical in quantities greater than the established threshold in the course of a calendar year.**

4) **Federal facilities** are also required to comply with EPCRA and the Pollution Prevention Act (PPA) of 1990, in accordance with Executive Order 13148. The Executive Order requires all federal facilities that manufacture, process, or otherwise use any listed EPCRA section 313 chemical above the reporting threshold to submit a Form R or a Form A. The first federal facility reports were submitted July 1, 1995 for calendar year 1994.

For each listed chemical that is manufactured, processed, or otherwise used over the course of a year in amounts equal to or greater than the thresholds, a Form R or a Form A must be submitted. For each chemical one form only, either the Form R or the Form A, should be submitted. The Form A is a simplified form with certain restrictions governing its use. Refer to EPA's "Toxic Chemical Release Inventory Reporting Forms and Instructions" (http://www.epa.gov/tri/report/index.htm) for further details. All foms received on or before February 12, 2003, have been incorporated into this report, including revisions for prior years.

DEQ POLICY AND PROGRAMS

It is the policy of the Virginia Department of Environmental Quality to protect the environment of Virginia in order to promote the health and well-being of the Commonwealth's citizens. To this end, the Department implements numerous programs, as described on the Department's website at http://www.deq.state.va.us/programs/homepage.html. These range from traditional programs on Air Quality, Water Quality, and Waste Management, to area programs (such as the Chesapeake Bay Program and the Virginia Coastal Program), to more specific programs (such as Small Business Assistance), and others too numerous to set out here. The Department remains committed to pollution prevention and elimination or reduction of wastes at the source of generation. Pollution prevention programs include the Virginia Innovations in Pollution Prevention (VIP2) Program, the Virginia Environmental Excellence Program, and the Virginia Mentoring Network. All parts of the agency and other sectors of government, all Virginia businesses and industry, and all Virginia's citizens have a role in managing and controlling the release of toxic chemicals in the Commonwealth.

Chapter 2- 2001 VIRGINIA TRI DATA REVIEW

For discussion purposes, the 2001 reporting year data are presented in three parts. Part One is the 2001 summary discussion; Part Two discusses the 2001 data in its entirety, and Part Three discusses the persistent bioaccumulative toxic (PBT) chemical reporting data in more detail. PBT reporting is being treated separately in this document due to its significance, lower regulatory reporting thresholds, and reporting accuracy requirements imposed on TRI PBT chemicals. In Part Two, the data are reported in whole numbers and in Part Three, because of the accuracy requirement, the data are reported with decimals.

Part One - 2001 Summary

MAJOR CHANGES IN REPORTING REQUIREMENTS FOR 2001 TRI

Lead and Lead Compounds Thresholds Lowered

On January 13, 2001 the United States Environmental Protection Agency (EPA) published a final rule (Federal Register Vol. 66, No. 11, Page 4499; 40 CFR Part 372) lowering the manufacturing, processing and otherwise used threshold reporting limits for lead and lead compounds to 100 pounds per year. The exception to the rule applies to lead contained in stainless steel, brass, and bronze alloys. The new reporting thresholds were effective for 2001 activity year reporting.

EPA has the authority under the Emergency Planning and Community Right-to-Know Act (EPCRA) Section 313(f)(2) to revise reporting thresholds. On October 29, 1999 (64 FR 58666), EPA published the final rule on TRI persistent bioaccumulative toxins. Included were criteria to be used to evaluate a listed toxic chemical as PBT chemical. Lead and lead compounds, along with seven new chemicals, two new chemical compounds, and nine existing listed TRI chemicals and chemical compounds categories were determined to be PBT at the time of the October final rule. In the October final rule, EPA lowered the reporting thresholds for those PBTs (effective for 2000 activity year reporting) but did not alter the statutory reporting threshold for lead and lead compounds until the final rule was published in January 2001.

PBTs are chemicals that are stable in the environment for long periods of time, build up in the environment, and accumulate in living tissues, particularly in food chains. Prior to the 2000 reporting year, TRI - PBTs had the same reporting thresholds as the non- PBTs at 25,000 pounds when manufactured or processed or at 10,000 pounds when otherwise used. Because of their toxicity at low levels to human health, and because the high thresholds severely limit the information on PBTs to communities, their reporting thresholds were lowered to allow for better capturing of information.

In addition to the lowering of the threshold limits, the new lead and lead compounds reporting rule disallows range reporting and the use of the simplified Form A report. Furthermore, the final rules modified the reporting rule to require reporting accuracy to one tenth (1/10) of a pound.

FEATURES OF VIRGINIA 2001 TRI DATA

As data were summarized and analyzed for reporting year 2001, several features appeared to stand out. The new lead and lead compound rules effective for the 2001 activity year resulted in first time TRI reporting for many Virginia facilities. Consequently, the number of TRI reports received for the 2001 reporting year increased. PBT chemicals reported in 2001 made up 0.6% of the total on-site releases for

activity year 2001. The newest addition to the PBT listing, lead and lead compounds, contributed to (97%) the total on-site PBT releases. Last year, in the 2000 TRI reporting, the on-site releases of PBT contributed to 0.04% of the total releases (this did not include the contribution from lead and lead compounds). For the 2001 reporting, lead and lead compounds did not rank in the top ten TRI chemicals released on-site into the air or surface water, but it was ranked sixth in on-site releases to land. Numerically, PBT releases are not a significant portion of the total on-site releases; however it is important to remember that even small releases of PBT chemicals can be significant to people and their environment. Reporting year 2001 data on PBTs can be found in Chapter 2, Part 3, starting on page 17.

For 2001 reporting, the amount of TRI chemical releases into the environment comprised less than 20% of the total reported TRI managed (see Figure 3).

Part Two - 2001 TRI Data for All Chemicals

For reporting year 2001, EPA anticipated an increase in overall reporting, especially from first time reporters (many were small businesses), due to the lower reporting thresholds for lead and lead compounds. For 2001, 508 Virginia facilities reported 2030 TRI forms (compared to 485 reporting facilities and 1930 forms in 2000). Altogether, approximately 70.7 million pounds of chemicals were reported to have been released on-site to the media (see Table 1). Air releases represented approximately 57.3 million pounds or 81.0% of all the chemicals released on-site in 2001. Releases to the water totaled approximately 7.0 million pounds or 9.9% of the total released on-site. Releases to the land equaled approximately 6.4 million pounds or 9.1% of the total on-site releases in 2001. Transfers to Publicly Owned Treatment Works (POTWs) were approximately 17.8 million pounds. Aside from transfers to POTWs, these facilities reported approximately 51.6 million pounds of TRI chemicals as transferred off-site (for treatment, recycling, energy recovery and disposal) and approximately 268 million pounds as managed on-site.

Table 1. Summary of Data by Type of Release, Transfer, and On-Site Management for TRI Chemicals (in pounds per year)**

ON-SITE RELEASES BY MEDIA (Section 5 of Form R)		
Total Air		57,250,252
Fugitive Air	7,588,107	
Stack Air	49,662,145	
Water		6,962,579
Land		6,438,304
Underground Injection Wells‡		5
Total On-Site Releases to Media		70,651,140

Table 1. (cont.) Reporting Year 2001 Chemicals

OFF-SITE TRANSFERS BY TYPE (Section 6 of Form R)		
Publicly Owned Treatment Works (POTWs) (includes metals and metal compounds)		17,805,370
Total Other Off-Site Transfers		51,639,923
Off-Site Transfers for Recycling	30,560,528	
Off-Site Transfers for Energy Recovery	8,601,373	
Off-Site Transfers for Other Treatment	2,850,674	
Off-Site Transfers for Disposal	9,627,348	
Total Off-Site Transfers		69,445,293

ON-SITE MANAGEMENT (Section 8 of Form R)		
Treated On-Site	145,665,713	
Recycled On-Site	94,875,493	
Energy Recovery On-Site	27,825,485	
Total On-Site Management		268,366,691

** Comparison between Table 1 and Figure 3 is discouraged. Table 1 contains data extracted from Sections 5, 6, and a portion of Section 8 of the TRI reports while Figure 3 is a compilation of all data reported only in Section 8.

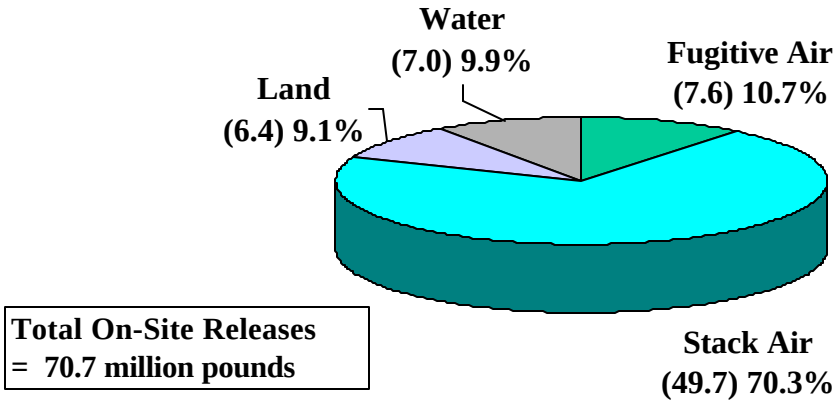
‡ One Virginia facility reported underground injection well release within a range of 1-10 pounds. This table took the midpoint of the range reporting and derived a value of 5 pounds.

TRI CHEMICAL RELEASES AND TRANSFERS

What is a release?

A release refers to on-site discharges of TRI chemicals to the air, water, land, and/or disposal in underground injection wells. Any reductions in waste achieved by on-site treatment methods are taken into account when facilities determine their release data.

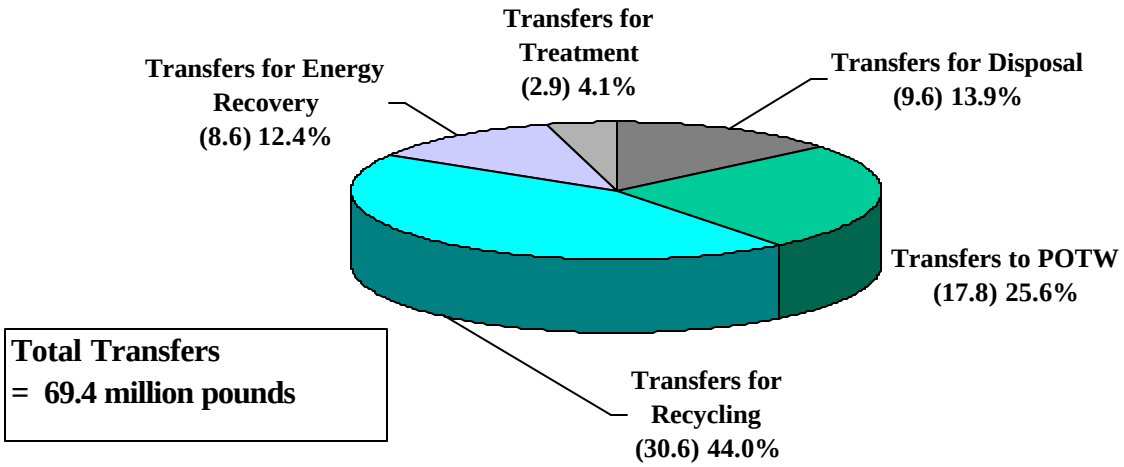
Figure 1. On-Site Releases of TRI Chemicals to All Media for Reporting Year 2001 (from Section 5 of Form R. The number inside the parentheses is the quantity of releases in each category in millions of pounds and the percent figure is the percent of total on-site releases.) Underground injection release was too small to show in this figure.



What is a transfer?

Transfers refer to TRI chemicals sent **off-site.** Transfers are reported as transfers to Publicly Owned Treatment Works (POTWs) or other off-site destinations such as incinerators, landfills, other treatment, recycling, energy recovery, and/or disposal facilities not part of the reporting facility.

Figure 2. All Off-Site Transfers of TRI Chemicals for Reporting Year 2001
(from Section 6 of Form R. The number inside the parentheses is the quantity of transfers in each category in millions of pounds and the percent figure is the percent of total transfers.)



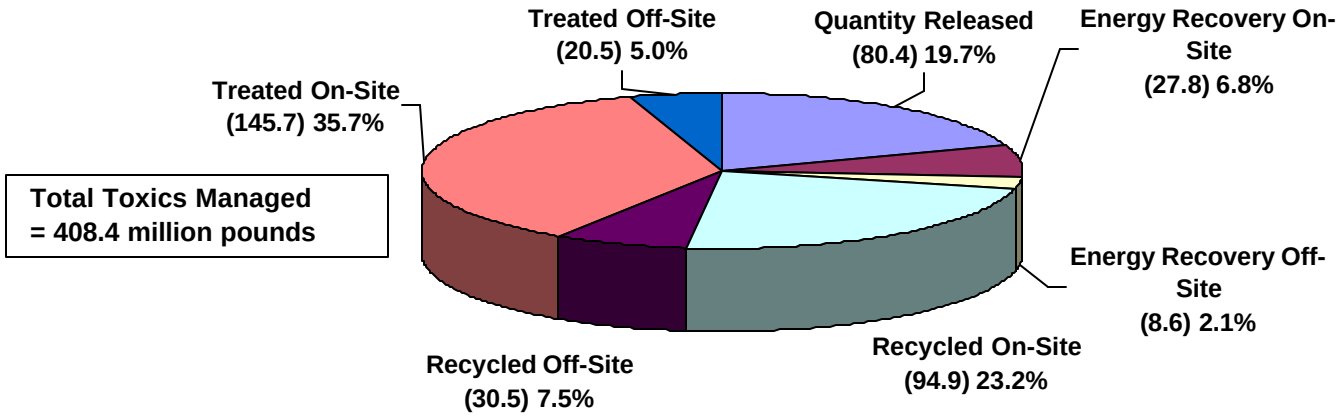
WHERE DID IT GO?

Under the Pollution Prevention Act of 1990 facilities subject to Section 313 of EPCRA must report their source reduction and recycling activities. Section 8 of the TRI Form R is where facilities report these activities. The previous charts (Figures 1 and 2) covering sections 5 and 6 of Form R reporting contain all on-site releases and off-site transfers including catastrophic releases and one-time events not associated with routine production processes. Section 8 of the Form R provides summary information of releases and transfers excluding those catastrophic releases and one-time events not associated with production processes. This section "Where Did it Go?" focuses on the section 8 production-related releases and transfers.

In general, facilities utilize several options to manage TRI chemicals. Treatment of waste, both on- and off-site, involves a variety of methods, including biological treatment, neutralization, incineration, and physical separation. Another option is on- or off-site recycling. This involves the toxic chemicals in wastes being recovered or regenerated and being returned for further processing or being made available for use in commerce. Energy recovery involves the combustion of toxic chemicals in industrial furnaces or boilers that generate energy for on- or off-site use. The least preferable and last management option is disposal, and that is considered a release to the environment either on- or off-site.

In 2001, approximately 408.4 million pounds of production related TRI chemicals were released, treated, recycled, or recovered both on- and off-site from Virginia facilities (Figure 3). Approximately 65.7% of the TRI chemicals were managed on-site and 14.6% were transferred off-site to be managed by various means. All together, less than 20% of the reported TRI chemicals were released into the environment. For 2001, DEQ performed additional quality control checks on Section 8 data under a grant from U.S. EPA.

Figure 3. 2001 Management of TRI Chemicals (from Section 8 of Form R. The number inside the parentheses is the quantity of TRI chemicals handled by each management option in millions of pounds and the percent value is the percent of the option to the total TRI chemicals managed by all options.)



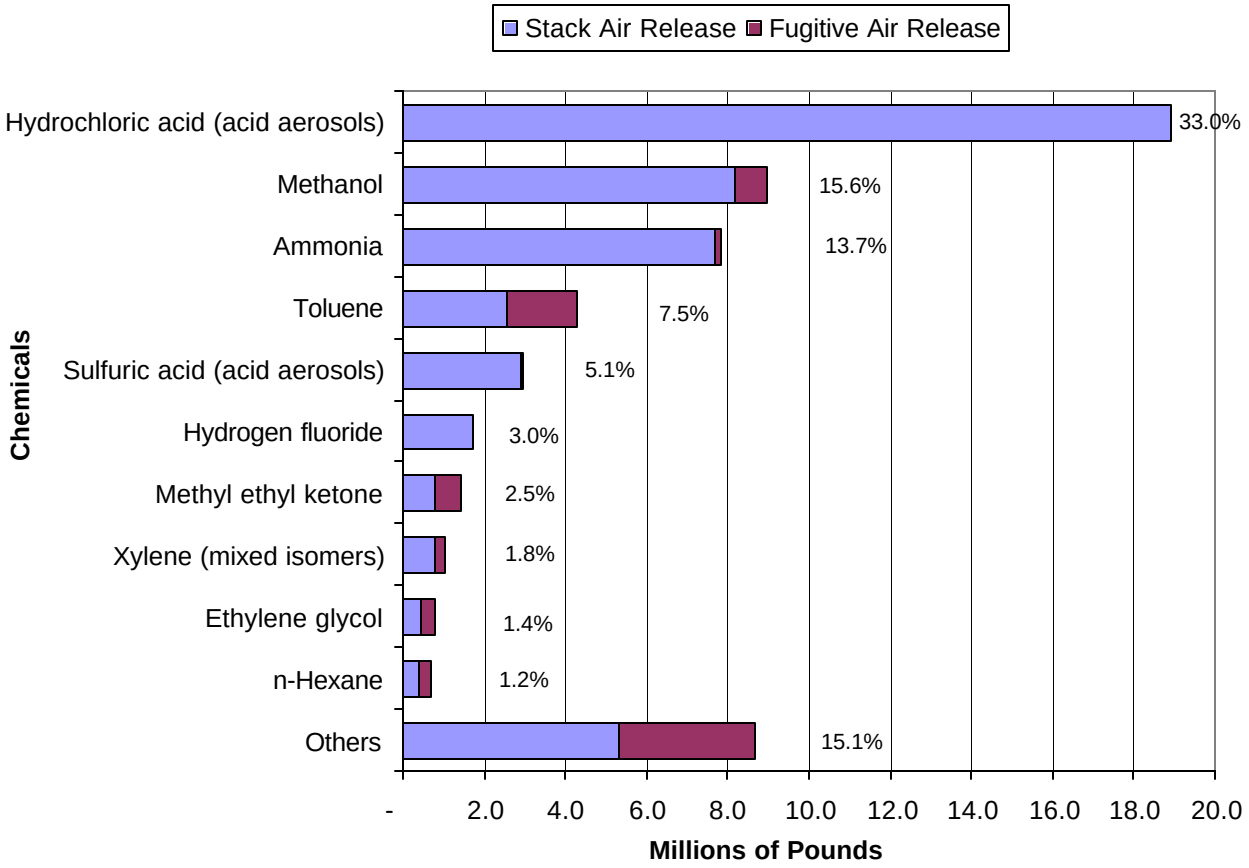
Transfers to POTWs that are reported in Section 6 of the Form R are required to be reported in Section 8 as either treated off-site or quantity released. Under Section 8 reporting, POTW transfers of non-metals are considered off-site treatment, while transfers of metals and metal compounds to POTW are not considered treated for destruction. These metals and metal compounds are finally disposed of through permitted discharges/releases; hence are considered releases for TRI purposes. Comparison between Table 1 and Figure 3 is discouraged. Table 1 contains data extracted from Sections 5, 6, and a portion of Section 8 of the TRI reports while Figure 3 is a compilation of all data reported only in Section 8.

2001 STATEWIDE RELEASES TO THE AIR

Air releases are classified as either "fugitive" (non-point source) or "stack" (point source) air emissions on-site. Examples of fugitive air emissions are equipment leaks from valves, pump seals, flanges, compressors, sampling connections, open-ended lines, and evaporative losses from surface impoundments and spills. Stack air emissions are releases to the air that are conveyed through stacks, ducts, pipes, vents, or other confined air streams. Most, if not all, facilities reporting to TRI have permitted stack air emissions.

Based on the amount of fugitive and stack air emissions reported, total air releases of all TRI chemicals was 57.3 million pounds, which accounted for 81.0% of the total on-site releases to media (air, land, and water). The top ten TRI chemicals released to the air made up approximately 84.9% of the total reported TRI air emissions in 2001 (See Figure 4). The top 10 TRI chemicals released to the air were: hydrochloric acid, methanol, ammonia, toluene, sulfuric acid, hydrogen fluoride, methyl ethyl ketone, xylene (mixed isomers), ethylene glycol, and n-hexane.

Figure 4. Top Ten TRI Chemicals Released to the Air in 2001 (from Section 5 of Form R. The number next to each bar is the % of total air releases for all 2000 chemicals reported.)
***Fugitive Air releases were too small to show up on the chart for sulfuric acid and hydrogen fluoride.

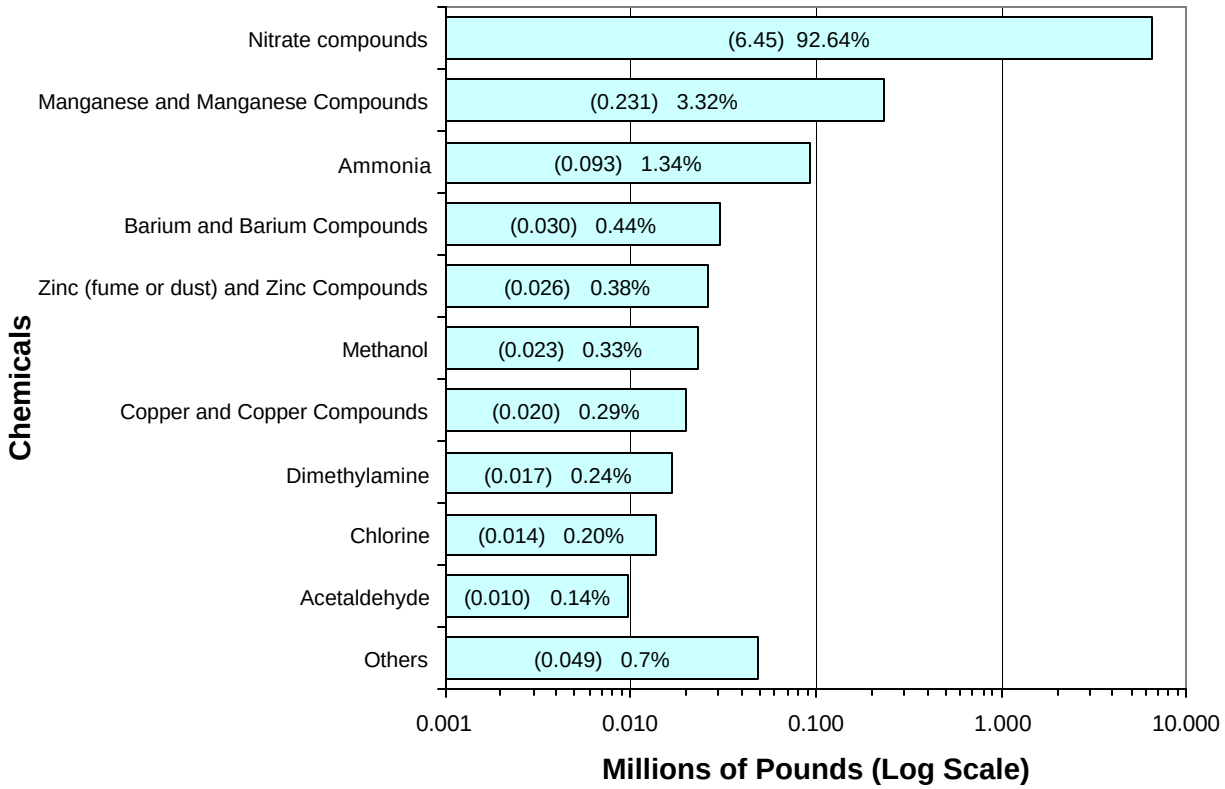


2001 STATEWIDE RELEASES TO WATER

The TRI report includes toxic chemicals discharged by facilities to surface waters, such as rivers, lakes, ponds, and streams. The Environmental Protection Agency (EPA) uses the TRI data in conjunction with water discharge permits developed by DEQ to review water quality. EPA can evaluate a facility by screening TRI data to determine if pollutants that are present may have the potential to cause an environmental hazard. Such pollutants will be further evaluated for possible inclusion in the permit. The TRI data can be used to confirm the presence of pollutants of concern when reviewing water quality monitoring data or can potentially flag a parameter that has not been previously monitored.

Reported releases of TRI chemicals to water totaled 7.0 million pounds and accounted for 9.9% of all on-site releases to the air, water, and land in 2001. Ten chemicals and chemical categories accounted for more than 99% of the TRI chemical releases to the water. The top ten TRI chemicals were: nitrate compounds (92.6% of total releases to water), manganese and manganese compounds, ammonia, barium and barium compounds, zinc and zinc compounds, methanol, copper and copper compounds, dimethylamine, chlorine, and acetaldehyde. Nitrate compounds are a common byproduct of industrial wastewater treatment processes and has consistently been reported as the major chemical released to the surface water. Nitrates can pose a nutrient problem to water bodies.

Figure 5. Top Ten TRI Chemicals Released to Water in 2001 (from Section 5 of Form R.) The information presented here is in logarithm base 10 scale, which compresses the bar chart to show up to 645 folds magnitude of difference between Nitrate Compounds and with the rest of chemical comparison. Please note the scale mark of 1.000 means 1 million pounds, the scale mark of 0.100 means 0.1 million pounds, etc.. The number in the parenthesis represents the quantity in millions of pound follows by percent to total reported releases.

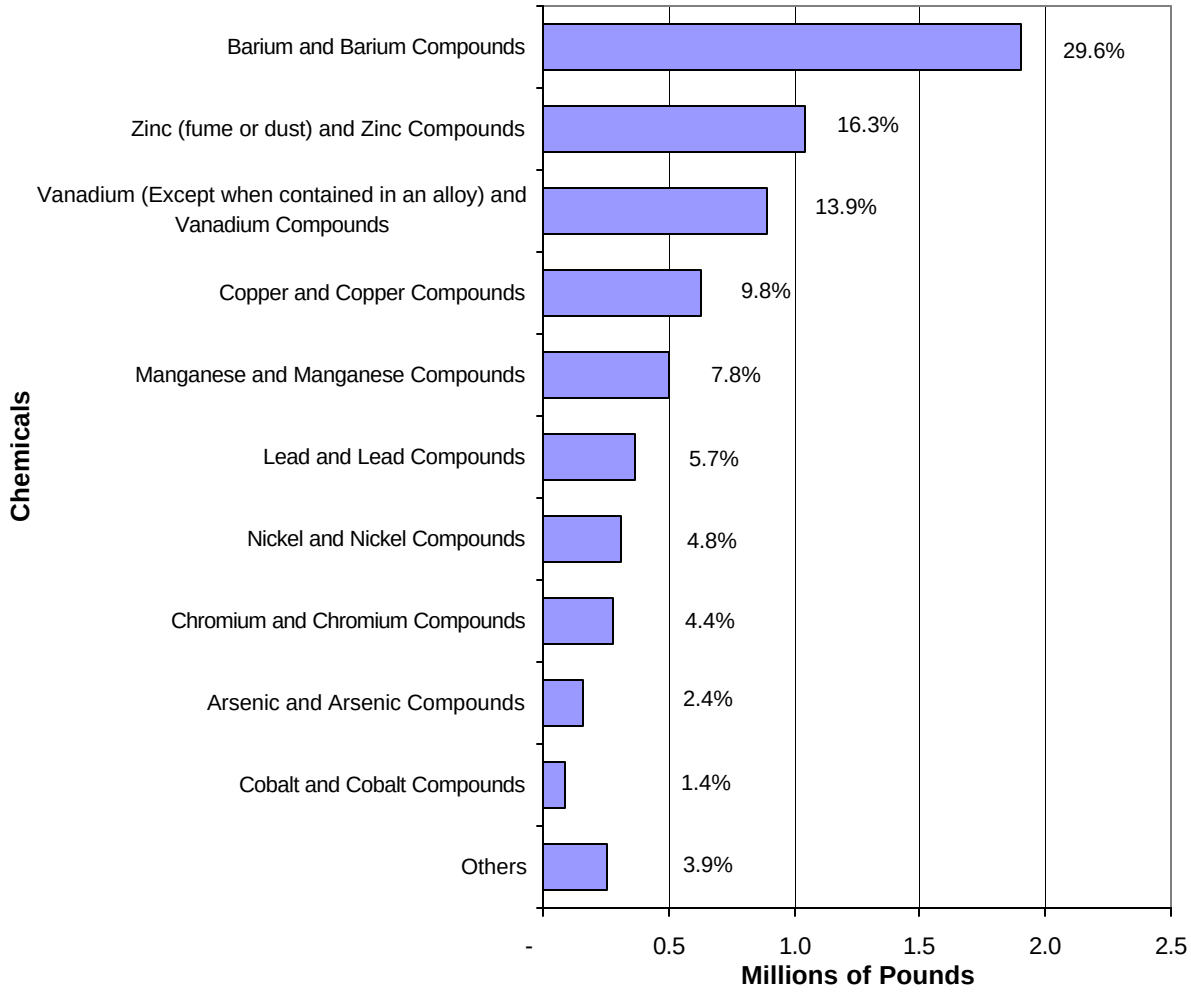


2001 STATEWIDE ON-SITE RELEASES TO LAND

On-site releases to the land refer to landfilling, surface impoundment, land treatment/application farming, or any other release of a TRI chemical to land within the boundaries of a facility. Virginia does not permit underground injection as a method of hazardous waste disposal.

The total amount of TRI chemicals released to the land in 2001 was 6.4 million pounds that accounted for 9.1% of all reported on-site TRI releases (releases to the air, water and land). The top ten TRI chemicals constituted approximately 96.1% of all the TRI chemicals released to the land. They were: barium and barium compounds, zinc and zinc compounds, vanadium and vanadium compounds, copper and copper compounds, manganese and manganese compounds, lead and lead compounds, nickel and nickel compounds, chromium and chromium compounds, arsenic and arsenic compounds, and cobalt and cobalt compounds (Figure 6). Metals and metal compounds such as barium are found naturally in coal combusted for energy generation and in the ashes remaining after combustion of the coal. Overall reporting of chemicals released on-site to land increased by 1.11% from 2000. This was mostly a result of additional reporting of lead and lead compounds from first-time filers due to the lowering of the reporting thresholds.

Figure 6. Top Ten TRI Chemicals Released to the Land (On-Site) in 2001 (from Section 5 of Form R. The number next to each bar is the % of total on-site land releases for all 2000 chemicals reported.)

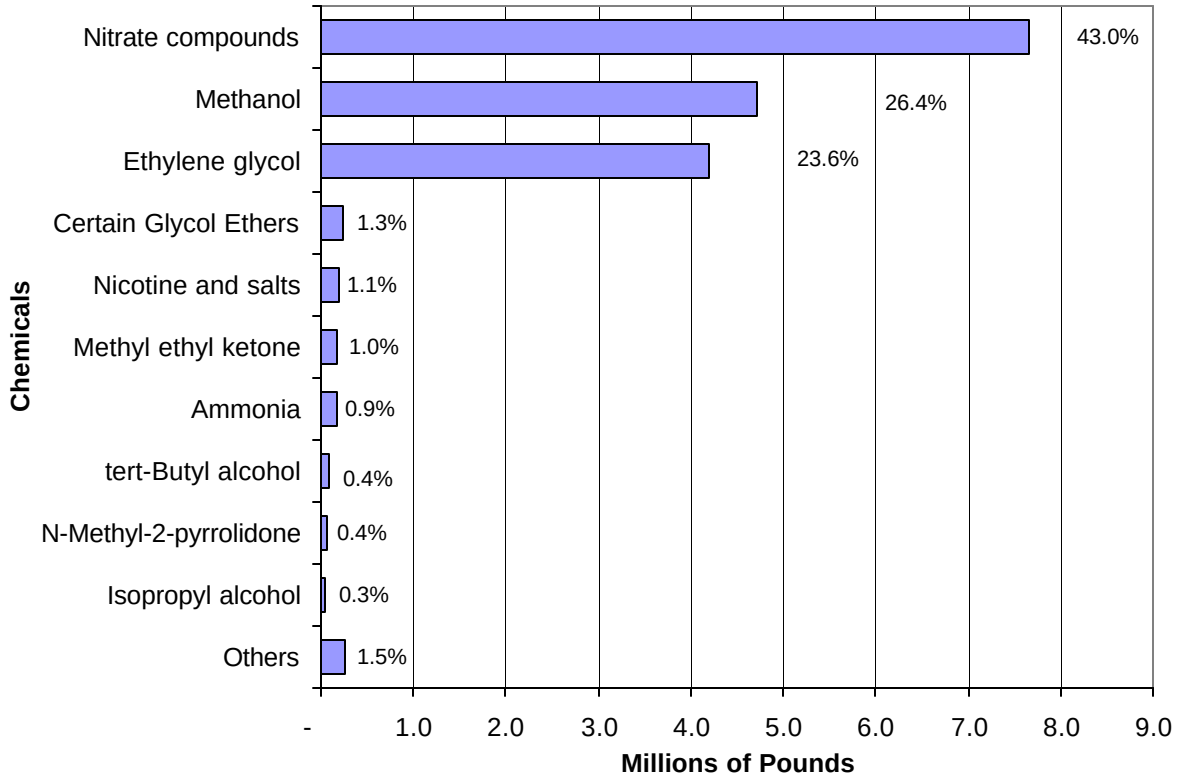


2001 STATEWIDE TRANSFERS TO PUBLICLY OWNED TREATMENT WORKS

A Publicly Owned Treatment Works (POTW) is a wastewater treatment facility that is owned by a state or local government. Wastewater from facilities reporting under TRI is transferred through pipes or sewers to the POTW. The TRI information summarized below simply reports transfers of a chemical to a POTW. However, this is not necessarily the same as the release of a chemical to the environment. TRI chemicals may be treated, destroyed, and/or removed from the environment in a POTW's physical, chemical, and biological treatment processes. Some TRI chemicals are almost completely destroyed by a POTW. The net release to the environment of some chemicals after the POTW treatment process can be up to 98% lower than the "transfers to POTW" value reported in the TRI. However, not all chemicals can be treated or removed by a POTW. Some chemicals such as metals and metal compounds may be removed, but are not destroyed, and may ultimately be disposed of in a permitted landfill or permitted land application process, and with any residual levels not removed being released through a permitted discharge to receiving waters.

Ten TRI chemicals accounted for approximately 98.5% or 17.5 million pounds of the total 17.8 million pounds of TRI chemicals transferred to POTWs in 2001. Transfers of TRI chemicals to POTWs made up 4.3% of the total amount of TRI chemicals released and managed on-site and off-site in 2001. Nitrate compounds are a common byproduct of industrial wastewater treatment processes and have been the leading pollutant discharged to POTWs for treatment.

Figure 7. Top Ten TRI Chemicals Transferred to Publicly Owned Treatment Works (POTWs) in 2001 (from Section 6.1 of the Form R. The number next to each bar is the % of total transfers to POTW)

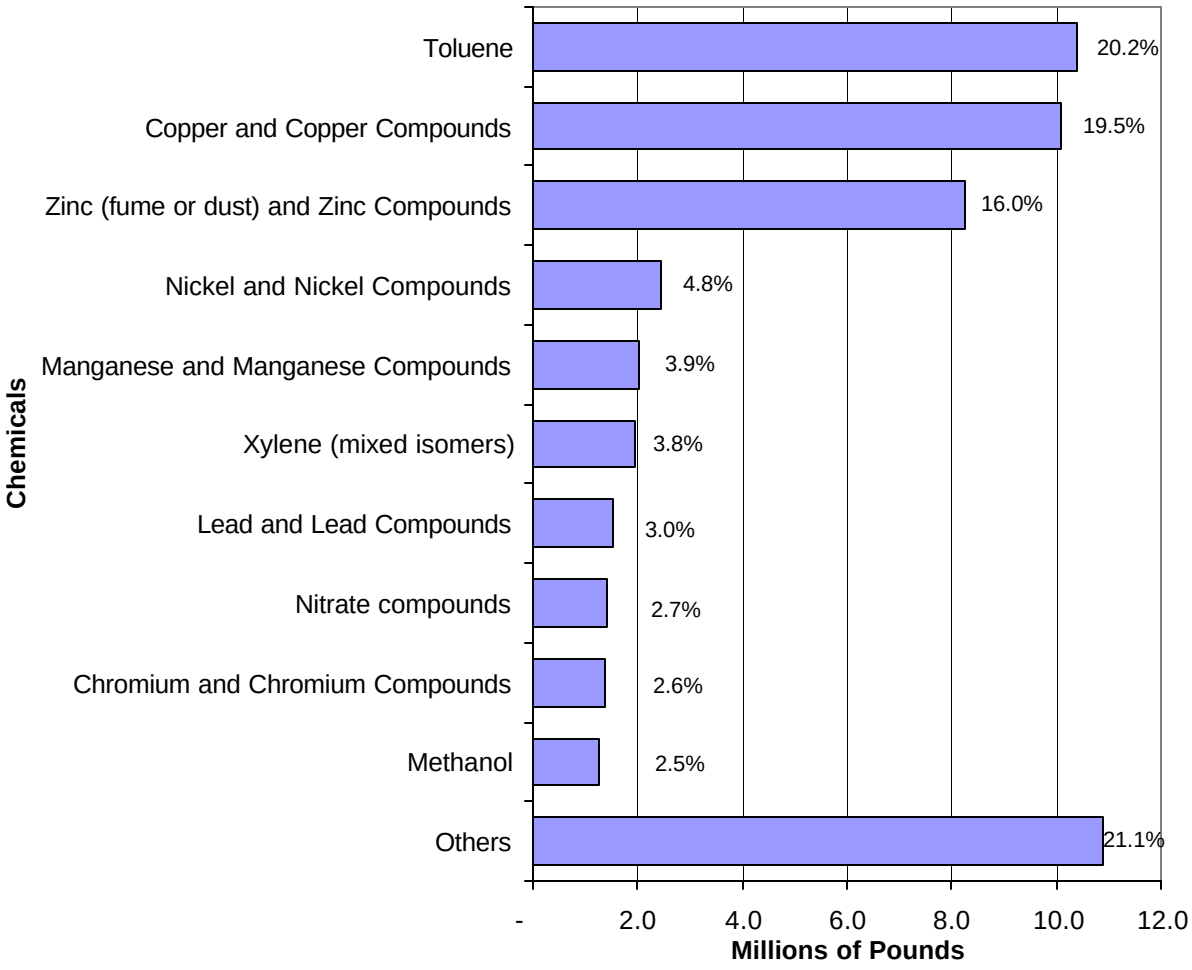


2001 STATEWIDE TRANSFERS TO "OTHER" OFF-SITE LOCATIONS

On the TRI reporting Form R the off-site transfers of TRI chemicals are divided into two categories: one for transfers to POTWs and the other for transfers to any facilities other than POTWs. This summary section focuses on the transfers to non-POTW facilities. The off-site locations (non-POTW facilities) that received transferred waste from reporting facilities included incinerators, landfills, other treatment, energy recovery, recycling, and/or disposal facilities. The off-site transfers can be to facilities located within Virginia or to facilities outside of Virginia.

The total amount of TRI chemicals transferred to other off-site locations was approximately 51.6 million pounds. Ten TRI chemicals represented approximately 78.9% of the total TRI chemicals transferred off-site to other locations (not including transfers to POTWs). The top ten TRI chemicals and chemical categories transferred off-site to locations other than POTWs in 2001 were: toluene, copper and copper compounds, zinc (fume or dust) and zinc compounds, nickel and nickel compounds, manganese and manganese compounds, xylene (mixed isomers), lead and lead compounds, nitrate compounds, chromium and chromium compounds, and methanol.

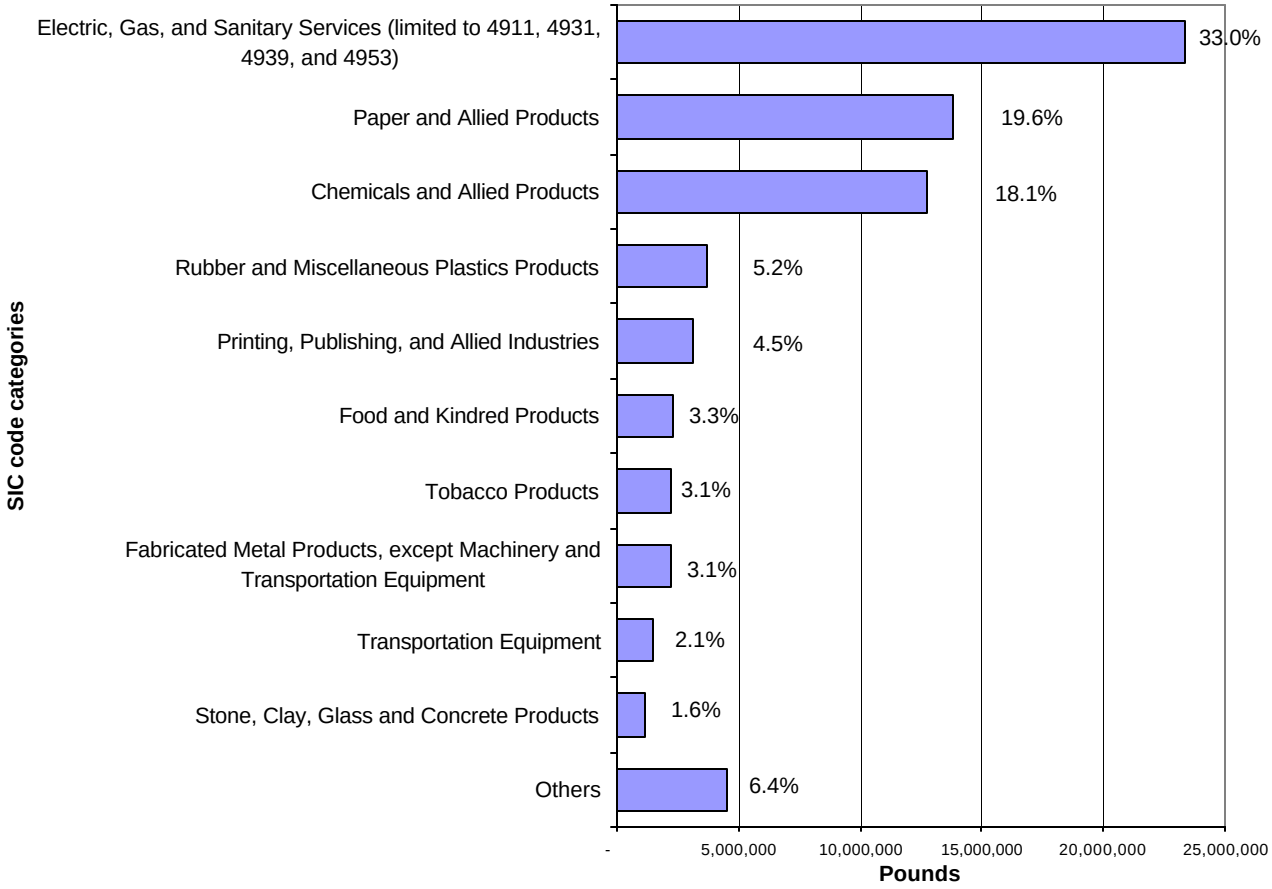
Figure 8. Top Ten TRI Chemicals Transferred to Off-Site Locations (not including POTWs) in 2001 (from Section 6.2 of the Form R. The number next to each bar is the % of total transfers to other off-site locations)



TOP REPORTING SECTORS OF TRI CHEMICALS

The top three reporting industrial sectors releasing TRI chemicals on-site for 2001, based on the primary Standard Industrial Classification (SIC) code, contributed to 70.7% of the total on-site releases to the environment. They are electric, gas, and sanitary services; paper and allied products; and chemicals and allied products. The rest of the top ten reporting industrial sectors for 2001 were: rubber and miscellaneous plastics products; printing, publishing, and allied industries; food and kindred products; tobacco products; fabricated metal products; transportation equipment; and stone, clay, glass and concrete products industries.

Figure 9. Top 10 Reporting Industrial Sectors (based on SIC codes) Releasing TRI Chemicals On-Site in Virginia for 2001 (from Section 5 of the Form R. The number next to each bar is the % of total on-site releases for all 2001 chemicals reported.)



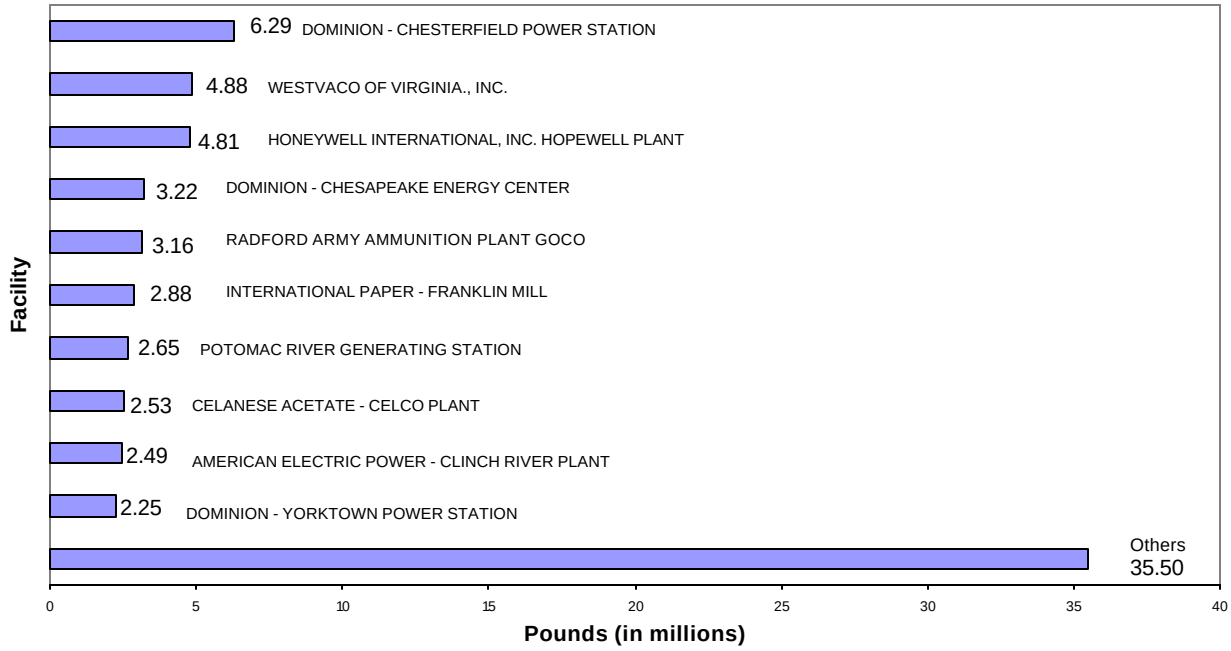
VIRGINIA FACILITIES

Virginia facilities that had the highest contributions to the on-site TRI chemical releases to the air (fugitive and stack), water, and land in 2001 were:

- Dominion - Chesterfield Power Station - 500 Coxendale Road, Chester, Chesterfield County
- Westvaco of Virginia., Inc. - 104 E. Riverside St, Covington, Alleghany County
- Honeywell International, Inc. Hopewell plant - Route 10 & Industrial Street, Hopewell City
- Dominion - Chesapeake Energy Center - 2701 Vepco Street, Chesapeake City
- Radford Army Ammunition Plant - government owned contractor operated (GOCO) - Route 114, Radford, Montgomery County
- International Paper - Franklin Mill - 34040 Union Camp Drive, Franklin, Isle of Wight County
- Potomac River Generating Station - 1400 North Royal Street, Alexandria City
- Celanese Acetate - Celco Plant - 3520 Virginia Avenue, narrows, Giles County
- American Electric Power - Clinch River Plant - Junction of State Rte 664 & 665, Cleveland, Russell County
- Dominion - Yorktown Power Station - 1600 Waterview Road, Yorktown, York County

These facilities accounted for 49.8% (35.1 million pounds) of all reported releases to these media for 2001. Figure 10 shows the quantity of TRI chemicals each of these facilities released in Virginia in 2001. Of the ten facilities, five are power generation facilities, two are paper and allied products facilities, two are chemical and allied products facilities, and one is a federal facility.

Figure 10. 2001 Top Ten Virginia Facilities Releasing TRI Chemicals On-Site (from Section 5 of the Form R. The number next to each bar is the total on-site releases (in millions of pounds) for each facility.)



Part Three - 2001 TRI Data for PBT Chemicals Only

Persistent bioaccumulative toxic (PBT) chemicals are chemicals that persist in the environment for long periods of time and bioaccumulate in living tissues. Because of these attributes, beginning with 2000 activity year reporting, EPA added several PBT chemicals to the TRI reporting list and lowered the reporting thresholds for 18 PBT chemicals and chemical categories in order to provide additional information to the public. Beginning with 2001 reporting, lead and lead compounds were added to the PBT list and their thresholds lowered to 100 pounds per year. This section covers those PBT chemicals reported to TRI that are subject to lower reporting thresholds. Table 2 shows the reporting thresholds for the TRI PBTs. The table also shows that only 8 of the 20 PBTs were reported by facilities in Virginia for reporting year 2001. In the past, lead and lead compounds were reported with higher thresholds and treated in the report analysis as non-PBT chemicals, but with the new PBT classification and the drop in reporting threshold in 2001, they are evaluated here with much more focus. Virginia received numerous first-time reporters as a result of the lead and lead compounds rule change. All together, 208 lead and lead compounds reports were received, and more than half of those received were due to the rule change. Table 3 provides an overall summary of 2001 PBT data. Information on the amounts of each individual chemical/chemical category released on-site, managed on-site, and transferred off-site for the eight PBT chemicals reported by Virginia facilities is provided in Table 4. Facility specific information on PBT chemicals is located in Appendix Table A-2.

Table 2. TRI reporting year 2001 persistent bioaccumulative toxic (PBT) chemicals

CAS Number	Chemical /Chemical Category Name	Reporting threshold	Reports received
309-00-2	Aldrin	100 pounds	0
191-24-2	Benzo(g,h,i)perylene	10 pounds	38
57-74-9	Chlordane	10 pounds	0
N150	Dioxin and Dioxin-Like Compounds	0.1 gram	40
76-44-8	Heptachlor	10 pounds	0
118-74-1	Hexachlorobenzene	10 pounds	0
465-73-6	Isodrin	10 pounds	0
7439-92-1	Lead	100 pounds	93
N420	Lead Compounds	100 pounds	115
7439-97-6	Mercury	10 pounds	7
N458	Mercury Compounds	10 pounds	35
72-43-5	Methoxychlor	100 pounds	0
29082-74-4	Octochlorostyrene	10 pounds	0
40487-42-1	Pendimethalin	100 pounds	0
608-93-5	Pentachlorobenzene	10 pounds	0
1336-36-3	Polychlorinated biphenyls (PCBs)	10 pounds	3
N590	Polycyclic aromatic compounds (PACs)	100 pounds	56
79-94-7	Tetrabromobisphenol A (TBBPA)	100 pounds	0
8001-35-2	Toxaphene	10 pounds	0
1582-09-8	Trifluralin	100 pounds	0

Table 3. Summary of Data by Type of Release, Transfer, and On-Site Management for PBT Chemicals **

(Dioxin and dioxin-like compounds are listed separately from the "Other PBT Chemicals" column because they were reported in grams, while the Other PBT Chemicals were reported in pounds. A conversion to pounds is shown in parentheses following the gram measurement.)

ON-SITE RELEASES BY MEDIA (Section 5 of Form R)	Dioxin and dioxin-like compounds (amounts for the year)	Other PBT chemicals (amounts for the year)
Total Air	116.91 grams (0.258 pounds)	55,535.51 pounds
Fugitive Air	0.12 grams (0.000 pounds)	8,206.56 pounds
Stack Air	116.80 grams (0.258 pounds)	47,328.95 pounds
Water	0.7145 grams (0.002 pounds)	5,805.43 pounds
Land	1.38 grams (0.003 pounds)	369,234.04 pounds
Total On-Site Releases to Media	119.00 grams (0.262 pounds)	430,574.98 pounds

OFF-SITE TRANSFERS BY TYPE (Section 6 of Form R)		
Publicly Owned Treatment Works (POTWs) (includes metals and metal compounds)	0 grams (0 pounds)	1320.31 pounds
Total Other Off-Site Transfers	43.63 grams (0.096 pounds)	1,542,871.04 pounds
Off-Site Transfers for Recycling	0 grams (0 pounds)	962,571.49 pounds
Off-Site Transfers for Energy Recovery	0 grams (0 pounds)	214.29 pounds
Off-Site Transfers for Other Treatment	0 grams (0 pounds)	6,527.86 pounds
Off-Site Transfers for Disposal	43.63 grams (0.096 pounds)	573,557.40 pounds
Total Off-Site Transfers	43.63 grams (0.096 pounds)	1,544,191.35 pounds

ON-SITE MANAGEMENT (Section 8 of Form R)		
Treated On-Site	0 grams (0.00 pounds)	5,564,859.30 pounds
Recycled On-Site	0 grams (0 pounds)	41,626.70 pounds
Energy Recovery On-Site	0 grams (0 pounds)	0 pounds
Total On-Site Management	0 grams (0.00 pounds)	5,606,486.00 pounds

**Facilities are allowed to report PBT chemicals up to 7 decimal places accuracy. For presentation purposes the summary amounts in this table have been rounded: however, the integrity of facility reported data has been maintained in the database. The specific data that was reported by each facility is located in the Appendix, Table A-2.

Comparing Table 3 to Table 1, the amount of reported PBTs released on-site was 0.61% of the total 70.65 million pounds released on-site to the environment. The reported PBTs comprised little more than 2% of the 268.4 million pounds of TRI chemicals managed on-site. A greater percentage of PBTs were transferred off-site for treatment, recycling, energy recovery, or disposal. They were about 2.22% of the total reported off-site transfers. Last year, in the 2000 TRI reporting, the on-site releases of PBT contributed to 0.04% of the total releases, and that was not counting contribution from lead and lead compounds.

Table 4. Reporting Year 2001 Amounts of TRI PBT Chemicals released on-site, managed on-site, and transferred off-site By PBT (Dioxin and Dioxin-like compounds have been converted to pounds and included in the totals)

Chemical Name	Released On-site (in pounds) (from Section 5)	Transferred Off-site (in pounds) (from Section 6)	Managed On-site (in pounds) (from Section 8)
Benzo(g,h,i)perylene	40.34	117.35	60,001.58
Dioxin and Dioxin-Like Compounds	0.26	0.10	0.00
Lead	144,736.27	790,894.24	23,617.60
Lead Compounds	273,325.53	739,248.90	22,748.00
Mercury	28.21	124.83	0.00
Mercury Compounds	3,614.16	1,322.33	0.00
Polychlorinated biphenyls (PCBs)	1.24	294.70	0.00
Polycyclic aromatic compounds (PACs)	8829.2	12,188.97	5,500,118.82
Total for all 8 chemicals/categories	430,575.21	1,544,191.42	5,606,486.00

Lead and lead compounds, PACs, benzo(g,h,i)perylene, and mercury compounds contributed most to the on-site releases to the environment, off-site transfers, and on-site management of PBTs chemicals. Lead and lead compounds contributed to the bulk (97%) of the PBT on-site releases. Looking back on Figure 6 (Statewide On-site Releases to Land) and Figure 8 (Statewide Transfers to Off-site Locations), together, lead and lead compounds ranked sixth in the on-site released to land and seventh in the quantity transferred off-site for management. The releases to the environment of lead and lead compounds and mercury compounds can occur to the air through stacks or to the land in fly ash disposed as a result of fuel (coal or fuel oil) combustion. Fly ash, in practice, is applied to land or disposed of in off-site landfills. PACs may form as a result of incomplete combustion of the same fuel or as by-product of industrial processes. PACs that are found in the waste stream can contain high enough heat value (Btu) to allow the waste to be incinerated for energy recovery.

A covered TRI facility determines the applicability of annual TRI reporting based on whether its industrial operation exceeds the threshold for each of the chemicals it manufactured, processed, or otherwise used in the previous calendar year. The definition of the three threshold activities is briefly described below:

- **Manufacture** - to produce, prepare, compound, or import an EPCRA section 313 chemical. It includes coincidental production as a by-product or impurity. For example, combustion of fuel can result in the coincidental manufacture of PBT chemicals.
- **Process** - the preparation of a listed EPCRA section 313 chemical, after its manufacture, for distribution in commerce. For instance, if a facility purchases toluene from a supplier and then combines toluene with various materials to form paint that it then sells, the facility processes toluene.

- **Otherwise use** - any use of an EPCRA section 313 chemical, including those contained in a mixture or other trade name product or waste, that is not covered by the terms manufacture or process. Burning fuels that contain EPCRA section 313 chemicals is considered otherwise use.

The TRI report captures the management activities and releases of those chemicals exceeding the manufacturing, processing, or otherwise use threshold values. Previous Tables and Figures have shown the management and environmental releases of those PBT reported to Virginia in 2001. In Table 5, the data shows the distribution of PBT reporting facilities with their activity threshold applicability.
A facility may report more than one type of activity for a TRI chemical, and Table 5 shows the number of facilities that reported each threshold activity and combination of activities.

Table 5. Activities and Uses of PBT chemicals at facilities (from Section 3 of the Form R)

	Activities reported						
Chemical Name	**manufacturing only**	**processing only**	**otherwise use only**	**both manufacturing &processing**	**both manufacturing &otherwise use**	**both processing &otherwise use**	**manufacturing &processing &otherwise use**
Benzo(g,h,i)perylene	5	8	6	5	10	0	4
Dioxin and Dioxin-Like Compounds	39	0	0	1	0	0	0
Lead	4	54	13	5	3	7	7
Lead Compounds	23	35	6	15	9	11	16
Mercury	1	1	2	0	0	0	3
Mercury Compounds	16	2	1	3	3	0	10
Polychlorinated biphenyls (PCBs)	1	0	2	0	0	0	0
Polycyclic aromatic compounds (PACs)	7	15	9	5	17	0	3
Total for all 8 chemicals/categories	96	115	39	34	42	18	43

Table 5 shows that “processing only” was the activity reported most often (115 times) for PBT chemicals, “manufacturing only” was reported 96 times, and the combination of "manufacturing, processing, and otherwise use" was reported 43 times. Main industrial sectors that reported processing of lead or lead compounds were the furniture and fixture industries; stone, clay, glass, and concrete products industries; primary metal and fabricated metal products industries; electronic or electrical equipment manufacturers; petroleum bulk plant operators; and manufacturer or transportation equipment. Dioxin and dioxin-like compounds are normally a product of incomplete combustion of waste stream containing chlorinated products. Lead or lead compounds can be co-manufactured under chemical manufacturing processes or as a by-product of fuel (coal or fuel oil) combustion. Industries such as primary metal; stone, clay, and glass products; transportation equipment manufacturers, electric power generation facilities, solvent recovery facilities, and paper and allied products industries were key reporters of lead compounds and mercury compounds in all three (manufacturing, processing, and otherwise used) activities. All together, 387 reports for PBTs were received out of a total of 2030 reports (19.1%).

GENERAL HEALTH AND ENVIRONMENTAL INFORMATION ABOUT PBTs

U.S. EPA has designated a list of chemicals as Persistent Bioaccumulative Toxic (PBT) chemicals due to their toxicity at low levels to human health and their tendency to persist (not readily be destroyed/break down) in the environment and bioaccumulate (build up or accumulate) in living tissues. This is the second year that TRI facilities had to report PBT chemicals if they manufactured (including co-production), processed, or otherwise used the chemicals. Because of heightened awareness of PBTs, this agency is providing the readers with generic information about the PBTs to further enhance their understanding of these chemicals.

The information on the following pages is a summary of general health and environmental hazards and effects for the eight TRI PBTs that were reported by Virginia facilities for 2001. This summary is an abbreviated compilation of chemical information from several public sector (government) and non-public sector publications and Internet sites. The chemicals are:

Benzo(g,h,i)perylene
Dioxin and Dioxin-like compounds
Lead
Lead Compounds
Mercury
Mercury Compounds
Polychlorinated Biphenyls (PCBs)
Polycyclic Aromatic Compounds (PACs)

Please note that the information presented is very general and does not suggest the level of public exposure to the chemicals or the risk associated with them. It is very important to recognize that the effects of exposure to any hazardous substance depend on the dose (concentration and quantity), duration (how long one is exposed), the route or pathway by which one is exposed (how one is exposed such as breathing, eating, drinking, or skin contact), personal traits (susceptibility) and habits, and whether other chemicals are present.

There are numerous reference sites for information on the chemicals listed above and they vary in scientific/technical detail. In this document, several preliminary reference sites are listed for readers with interest in researching more detailed information. Before reaching any conclusion on exposure, risk, and health effects, readers should consult these and other reference sites as well as their physicians for information.

Benzo(g,h,i)perylene

What Is It?: It appears as pale yellow green crystals and is categorized as a polycyclic aromatic hydrocarbon (PAH). It is usually formed as a by-product of incomplete combustion.
Sources and Uses: Fossil fuel (No.2 & 6 Fuel Oils and gasoline) combustion for heat and power generation (including motor vehicle operation) is the primary source of Benzo(g,h,i)perylene. However, other industrial processes may also contribute to its formation. These processes may be synthetic fuel production, coal processing, asphalt paving, and petroleum refining.
Environmental Fate and Exposure: This substance is normally released to the environment via stack air or scrubber wastewater. It can be absorbed into the body by inhalation of its aerosol, through the skin, or via food chains important to humans. Bioaccumulation tends to take place in oils and fats. It has been found to be highly toxic at relatively low concentration to fish, daphnia, and algae.
Health Effects: Not classifiable as human carcinogen.
Regulatory Limits: It is listed as a priority pollutant under the Clean Water Act (CWA) and is also regulated under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) with a release reportable quantity of 5,000 pounds or more.
References: EPA PBT Chemicals Final Rule (40 CFR Part 372 - (VI) Summary of Public Comments & EPA Responses (G2)); Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category, EPA 745-B-01-00X, March 2001; Guidance for Reporting Toxic Chemicals: Pesticides and Other Persistent Bioaccumulative Toxic (PBT) Chemicals, EPA 260-B-01-005, August 2001; International Chemical Safety Cards - (http://www.itcilo.it/english/actrav/telearn/osh/ic/191242.htm). EPA Integrated Risk Information System (IRIS) - (http://www.epa.gov/iris/). U.S. Dept. of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR) - (http://www.atsdr.cdc.gov/toxprofiles/).

Dioxin and Dioxin-Like Compounds

What Are They? Dioxin is a commonly used term for a family of toxic chemicals that share a similar chemical structure and common mechanism of toxic action. The 17 dioxin and dioxin-like compounds listed by EPA under the TRI PBT rule are all multiple chlorinated compounds.

Sources: Dioxin and dioxin-like compounds are formed as a result of incomplete combustion of fuel (mainly oil, coal and wood), incineration of municipal solid waste, incineration of medical waste, residential burning of wood and household waste, and forest fires. Dioxin and dioxin-like compounds can be generated as unintentional by-products from secondary copper smelting, cement kiln operations, metal production, wood preservative process, or chlorine bleaching of wood pulp.

Uses: In 1997 the commercial production of large quantities of dioxin and dioxin-like compounds such as polychlorinated biphenyls (PCBs) and polybrominated biphenyls (PBBs) was ceased in the U.S. PCBs were used as a component of dielectric fluid, hydraulic fluids, plastic, and paints because of their low-burning and insulation quality. Likewise, PBBs were produced for their flame-retardant quality. The dioxin and dioxin-like compounds category reported under TRI does not include any PCBs or PBBs.

Environmental Fate: Trace amounts of dioxin and dioxin-like compounds are mainly introduced to the environment through air releases. Because of their persistence to stay intact (atmospheric deposition) in the environment for a very long period of time, they can be carried to far away distances before being deposited onto plants, buildings and pavement, soil and water. They can be distributed into water bodies through urban area storm water runoff or soil erosion.

Exposure: Dioxin and dioxin-like compounds are widely distributed in our environment, in very low parts per trillion amounts. These chemicals can accumulate in fatty tissues of animals and these accumulations can pass up the human food chain. According to dioxin research, most people have a detectable level of dioxin in tissues and our exposure came mainly from eating animal fat from beef, pork, poultry, fish, and dairy products. Most of the meat and dairy products we consume do not come from local but from national food supply infrastructure; therefore, most of our dioxin exposure does not come from local sources within our community.

Health Effects: Dioxins are classified as probable human carcinogens. The best studied member of the dioxin family - 2,3,7,8 TCDD - is a known human carcinogen. Adverse non-cancer health effects have been observed both in animals and to a limited extent, in humans. Health effects specifically observed in humans are changes in early childhood development (immune system and learning behavior) and hormone levels (endocrine disruption), and serious skin disease called chloracne. In animals, these effects include changes in hormone systems, fetal development, reduced reproductive capacity, and immunosuppression.

Regulatory Limits: EPA and other researchers are working to resolve questions such as

- Is there a low level of exposure that is harmless?
- Are current background exposure levels harmful to adults or children?
- What are the most important sources of dioxins?

References: USEPA web site on Persistent Bioaccumulative and Toxic (PBT) Chemical Initiative (http://www.epa.gov/pbt/dioxins.htm). EPA PBT Chemicals Final Rule (40 CFR Part 372 - (VI) Summary of Public Comments & EPA Responses (G1)). Emergency Planning and Community Right-to-Know Act - Section 313: Guidance for Reporting Toxic Chemicals within the Dioxin and Dioxin-Like Compounds Category, EPA-745-B-00-021, Dec 2000. EPA National Center for Environmental Assessment, draft publications and web sites: Draft Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds, Sept. 2000; (http://cfpub.epa.gov/ncea/cfm/dioxin.cfm?ActType=default) and (http://cfpub.epa.gov/ncea/cfm/nceahome.cfm).

Lead and Lead Compounds

What Are They? Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Lead can combine with other chemicals to form what are usually known as lead compounds or lead salts.

Sources: Much of lead comes from human activities including burning fossil fuels and solid waste, mining, and manufacturing (e.g. copper and lead smelters, glass manufacturing plants, and metallic mineral processing plants). Human activities (such as the former use of "leaded" gasoline) have spread lead and substances that contain lead to all parts of the environment.

Uses: Lead has many different uses. It is used in the production of batteries, ammunition, monitors, metal products (solder and pipes), cable covering, and devices to shield X-rays. Lead is also used in scientific equipment (circuit boards for computers and other electronic circuitry). Because of health concerns, lead from gasoline, paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years.

Environmental Fate: Lead itself does not break down, but lead compounds are changed by sunlight, air, and water. Once lead falls onto soil from the air, it usually sticks to soil particles. Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.

Exposure: Exposure may come from eating food or drinking water that contains lead; spending time in areas where lead-based paints have been used and are deteriorating; working in a job where lead is used; using health-care products or folk remedies that contain lead; and engaging in certain hobbies in which lead is used (e.g. stained glass).

Health Effects: Lead is an irritant to the eyes, nose, and throat. Lead can affect almost every organ and system in your body (e.g. cardiovascular, gastrointestinal, hematological, hepatic, renal, endocrine, immunological, reproductive etc.). The most sensitive is the central nervous system. Young and unborn children are more vulnerable to lead poisoning than adults. The effects are the same whether it is breathed or swallowed. At high levels, lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect the memory. Lead may cause anemia. It can also damage the male reproductive system. The Department of Health and Human Services has determined that lead acetate and lead phosphate may reasonably be anticipated to be carcinogens based on studies in animals. There is inadequate evidence to clearly determine lead's carcinogenicity in humans.

Regulatory Limits: USEPA: (a) Action Level of 0.015 mg/L for water treatment facilities; (b) Human Health Water Quality Criteria for aquatic organisms and drinking water of 43 ug/L; (c) Reference air concentration (RAC) of 9.0E-02 $\mu g/m^3$.
HUD: Action Level for lead-based paint of 1 mg/m^3. OSHA: (a) Permissible Exposure Limit (PEL) of 0.05 mg/m^3 averaged over an 8-hour workshift and (b) Blood level of concern of 40 µg/dL NIOSH: Airborne Exposure Limit of 0.1 mg/m^3 averaged over a 10-hour workshift.

References: (1) Agency for Toxic Substance and Disease Registry (ATSDR). 1999. Toxicological profile for lead. Atlanta, GA: U.S. Department of Health and Human Services.
(2) USEPA. 2001. National Primary Drinking Water Standards. Office of Water.
(3) New Jersey Department of Health and Senior Services. 2001.Hazardous Substance Fact Sheet
(4) Risk Assessment Information System (RAIS). 2003. http://risk.lsd.ornl.gov/rap_hp.shtml

Mercury and Mercury Compounds

What Are They? Mercury is a naturally occurring metal in trace amounts in igneous and sedimentary rocks. The elemental metallic mercury is a shiny, silver-white, odorless liquid.

Sources: Mercury is found principally in the form of the ore cinnabar (mercury sulfide) and elemental mercury is extracted through simple oxidation process. Trace amounts of mercury or mercury compounds are found in fuel oil, coal, copper ores, sulfide ores, and gold ores as impurity. In the combustion of the fuel, mercury or mercury compounds are converted to other forms of mercury compounds or to elemental mercury. Under certain recovery processes, mercury can be recovered from scraps from secondary smelting operations; as a by-product of gold mining; scrapped equipment, instrument, and electrical devices; and industrial waste.

Uses: Mercury and mercury compounds are used in thermometers, thermostats, some batteries, cameras, cathode tubes, some calculators, small appliances, mercury vapor lamps, fluorescent lamps, electrical switches, hearing aids, common household disinfectant/cleaners, electrodes, dental fillings, and antifungal skin ointments. In industrial applications, mercury is used in custom compound resins and chlor-alkali (production of chlorine gas and caustic soda) manufacturing. However, the chlor-alkali process using mercury cell has declined significantly over the last 20 years. Mercury is also used as fluid bearing and fluid clutches that require a heavy liquid. It is fairly non-reactive and is very resistant to corrosion.

Environmental Fate Inorganic mercury or mercury compounds can enter into the air through stack exhaust from manufacturing plants, combustion of fuel or waste. It can enter the water or soil from natural deposits, rain deposition, water runoff from industrial sites or fungicides containing mercury, or wastewater treatment sludge. Organic mercury, such as methyl mercury may be formed in water and soil by bacteria. It can build up in fish tissues and in other organisms and the level of mercury or mercury compounds accumulates up the food chain.

Exposure: Exposure may come from eating fish or shellfish contaminated with or seed grains containing a high level of methyl mercury; breathing vapor in air coming from incinerators or industrial facilities that burn mercury-containing waste or fuels; or release of mercury during dental and medical treatments.

Health Effects: Methyl mercury is considered the most harmful form because it can pass through the blood stream into the brain more readily than any other form. Exposure to methyl mercury is more dangerous for young children than for adults and can interfere with their normal development. High levels of exposure to any form of mercury can result in permanent damage to the brain, kidney, and developing fetus. Short-term exposure can cause lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation. Mercury or mercury compounds have not been determined to be carcinogenic to humans due to lack of data.

Regulatory Limits: The U.S. EPA has set a limit of two parts of mercury per billion parts of drinking water (2 ppb) and has required reporting of discharges or spills of mercury containing material equal to or greater than one pound (1 lb). U.S. FDA has set a maximum permissible level of one part of methyl mercury in a million parts of seafood (1 ppm). OSHA has set a limit of one milligram of mercury per 10 cubic meters of work place air (1 mg/10mg^3) that should not be exceeded during any of the workday.

References: Mercury fact sheet - University of Wisconsin - (http://www.geology.wisc.edu/~jill/hg.html). Emergency Planning Community Right-to-Know Act - Section 313: Guidance for Reporting Toxic Chemicals: Mercury and Mercury Compounds Category, EPA 260-B-01-004, August 2001. U.S. EPA PBT web site - (http://www.epa.gov/pbt/mercury.htm). International Chemical Safety Cards (www.itcilo.it/english/actrav/telearn/osh). New Jersey Department of Health and Senior Services, Hazardous Substance Fact Sheet - Mercury and on other Mercury compounds.

Polychlorinated Biphenyls (PCBs)

What Are They? PCBs are man-made substances (chlorinated compounds known as congeners). They are oily liquids or solids and are colorless to light yellow, and have no smell or taste. Many commercial PCB mixtures are known by the trade name Aroclor.
Sources and Uses: PCBs were manufactured as coolants and lubricants because they do not burn easily and are good insulators. Manufacturing of PCBs stopped in the United States in 1977 due to their ability to build up in our environment and cause harmful health effects. Although their productions was ceased, trace amounts of less than or equal to 50 parts per million (ppm) of PCBs can still be found in dielectric fluid (utility transformer fluid.)
Environmental Fate: PCBs entered the environment during their manufacturing, use and disposal; from accidental spills or leaks during their transport; and from leaks or fires in products containing PCBs. They can also be released to the environment from hazardous waste sites, illegal or improper disposal of industrial wastes or consumer products, or burning of some industrial wastes in incinerators. Once entered into the environment, they persist there for a very long time. In air, PCBs can travel long distances and can be deposited far away from its source of origin. They bind strongly to soil. A small amount of PCBs may dissolve in water, but largely, they stick to organic particles or sediments.
Exposure: Small organisms and fish take up PCBs. They can accumulate up the food chain by other animals that eat these aquatic animals, reaching levels that may be many thousands of times higher than in water. Humans (especially children) can be exposed to PCBs through skin contact or unintentional ingestion of PCB contaminated soil from hazardous waste or illegal dump sites, or old PCB-containing electric appliances, equipment, or transformers. Exposure can also come from eating PCB-contaminated fish or fish eating animals, or breathing vapor where electrical equipment containing PCBs were released or unprotected.
Health Effects: PCBs are probable human carcinogens and known carcinogens to animals. They posed multiple negative chronic health effects such as liver damage; nervous system damage; acne-like skin rash; reproductive damage in adults; and neurobehavioral and immunological changes in children. PCBs can be passed to an infant through mother's milk. Acute (short-term) exposure can result in irritation to the respiratory system and difficulty in breathing.
Regulatory Limits: Safe Drinking Water Act (SDWA) regulations set PCBs limit of 0.0005 milligrams per liter of drinking water (0.0005mg/L). Discharges, spills or accidental releases of one (1) pound or more of PCBs into the environment must be reported to EPA. The Federal Food and Drug Administration (FDA) requires that infant foods, eggs, milk and other dairy products, fish and shellfish, poultry and red meat contain no more than 0.2 – 3 parts of PCBs per million parts of food (0.2 – 3 ppm). The Toxic Substance Control Act (TSCA) regulation has set a "non-PCB-containing" transformer fluid limit to less than or equal to 50 parts of PCBs per million parts of fluid (50 ppm).
References: U.S. Dept. of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR) - (www.atsdr.cdc.gov/toxprofiles). USEPA web site on Persistent Bioaccumulative and Toxic (PBT) Chemical Initiative (http://www.epa.gov/pbt/pcbs.htm). Public Health Implications of Exposure to Polychlorinated Biphenyls (PCBs), U.S. Public Health Service, The Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services and The U.S. Environmental Protection Agency, Feb. 2, 1999.

Polycyclic Aromatic Compounds (PACs)

What Are they? Polycyclic aromatic compounds (PACs) are also known as polycyclic aromatic hydrocarbons (PAHs). Although there are over 100 of these chemicals, only 21 of them are listed by TRI to persist in the environment and/or bioaccumulate in living tissues. Most are formed during the incomplete combustion (burning) of fuel, garbage, agricultural by-products, forest fires, volcanoes, or other organic substances like tobacco, or charbroiled meat.

Sources and Uses: Some PACs are manufactured and they exist as colorless, white, or pale yellow green solids. They are components of fossil fuels and can be found in coal tar, creosote, and roofing tar. Few are used in medicines or to make dyes, plastics, and pesticides. Other sources of PACs can be found in industrial processes such as iron foundries, petroleum processing, primary aluminum producers, coke ovens, pulp mills, portland cement kilns, and carbon black manufacturing. PACs are emitted from vehicle exhausts and as soot. A large portion of the PACs reported by Virginia facilities were the result of fuel usage and incomplete fuel (oil, gas, or wood) combustion.

Environmental Fate: PACs can enter into the air from combustion exhaust and by attaching to dust particles. Some can breakdown by reacting with sunlight or other chemicals in the air over a period of time. PACs entered into the water through discharges from industrial and wastewater treatment plants. Most do not dissolve readily in water; therefore they tend to stick to solid particles and settle to the bottoms of lakes or rivers. Because they have aromatic hydrocarbon properties, they can readily evaporate into the air from soil or surface waters. PACs move through soil by attaching tightly to particles and may contaminate ground water or be absorbed by plants.

Exposure: Exposure to PACs can occur through breathing air containing PACs; coming in contact with contaminated water or soil near hazardous waste sites; consuming contaminated water, cow's milk, or other vegetable, cereal, or beef products; and eating grilled or charred meats.

Health Effects: Laboratory animal studies have shown that PACs can cause harmful effects on the skin, body fluids, animal reproductive capability, and their ability to fight diseases after both short and long term exposures. Several PACs are known animal carcinogens (cancer causing); some are determined by the International Agency for Research on Cancer (IARC) to be possible or probable human carcinogens. And there are some that have not been classified for carcinogenic effects by U.S. Dept. of Health and Human services.

References: EPA PBT Chemicals Final Rule (40 CFR Part 372 - (VI) Summary of Public Comments & EPA Responses (G3-4)); Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category, EPA 745-B-01-00X, March 2001; International Chemical Safety Cards (www.itcilo.it/english/actrav/telearn/osh); EPA Integrated Risk Information System (IRIS) - (http://www.epa.gov/iris) on selective PACs; U.S. Dept. of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR) - (www.atsdr.cdc.gov/toxprofiles) on selective PACs.

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Chapter 3 - VIRGINIA TRI HISTORICAL COMPARISON

Since its inception, the TRI program has been expanding and evolving, providing more information to the public about the presence and release of toxic and hazardous chemicals in communities. In fact, over the past 13 years three major regulatory changes have occurred that made the direct historical comparison of releases from 1988 to 2001 difficult and potentially misleading. During the early years of the program there were no major reporting changes. From 1988 until 1994 the consistency between reporting sectors and chemicals made it easy to compare data year to year. The first major change in reporting requirements was the addition of 286 chemicals and chemical categories to the TRI list beginning with reporting year 1995. The addition of chemicals in reporting year 1995 created a new baseline for TRI comparisons from that point forward, a comparison that represented similar reporting sectors and similar chemicals and chemical categories. The second major change was the inclusion of seven non-manufacturing sectors (sectors that had never previously reported to TRI) to the TRI facility coverage beginning in the 1998 TRI reporting year. With this most recent change 1998 became the new baseline from which to make comparisons. Thus, the historical comparison in this section covers the period 1998 to 2001 since those years cover the same reporting sectors. Historical evaluations of on-site releases from 1988 to 1994, and from 1995 to 1997 can be found in the Appendix. Additionally, beginning from reporting year 2000, seven chemicals and two chemical categories (PBTs and vanadium and vanadium compounds) were added to the TRI chemical list. These newly added chemicals and chemical categories, that had not been reported in the past, were subtracted from reporting year 2000 and 2001 data to make the year to year comparisons accurate.

Table 6 shows the amounts of releases to each media for the reporting years 1998 through 2001. Figure 11 shows the historical on-site releases from 1998 to 2001 using stacked bars to look at the differences in media.

Table 6. On-Site Releases Comparison from 1998 to 2001 (from Section 5 of Form R)

* Newly added chemicals in 2000 that were not reported previously were not counted for this data comparison.

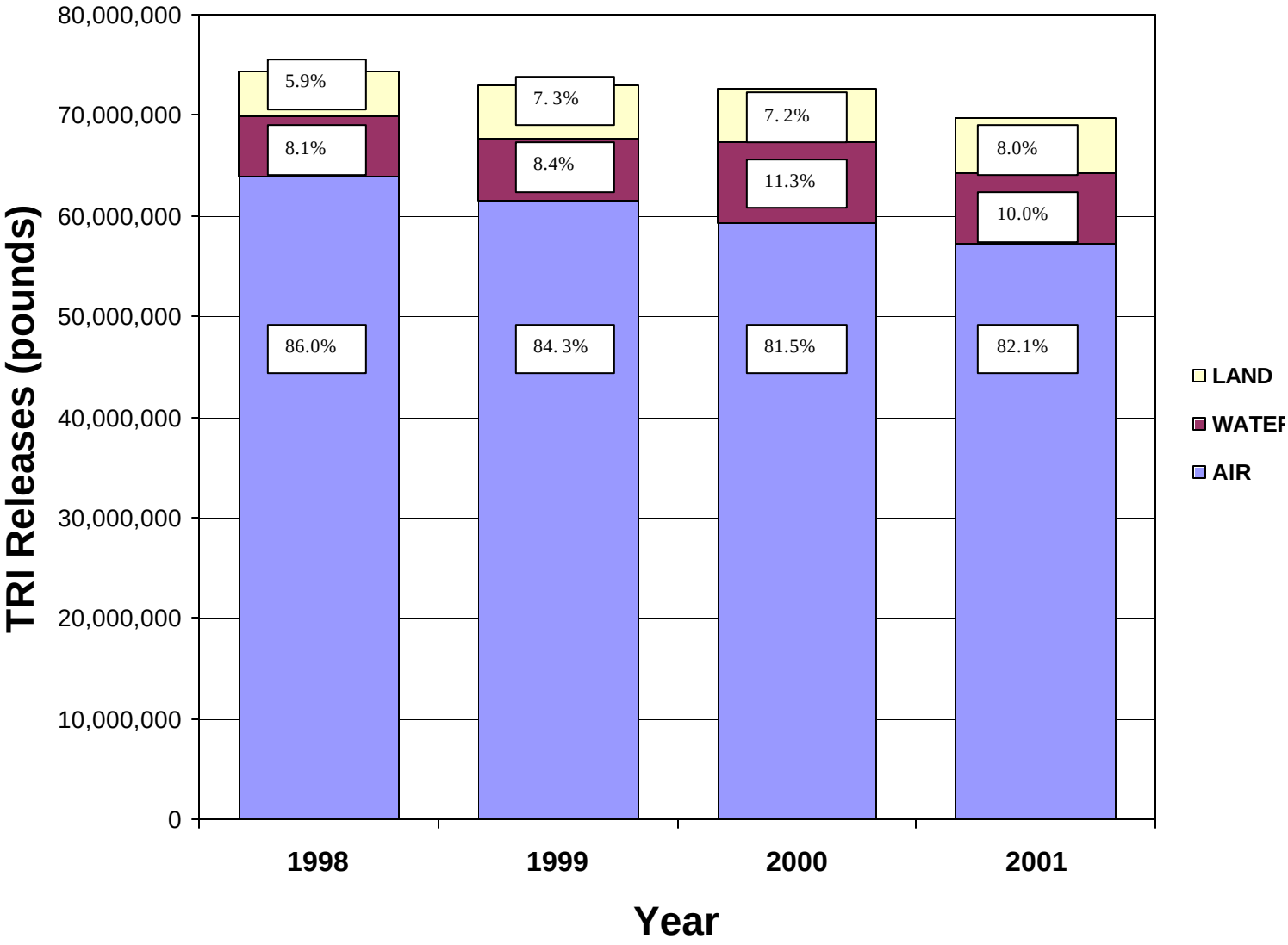
Media	1998 (pounds)	1999 (pounds)	2000 (pounds)	2001 (pounds)	Percent change 1998-1999	Percent change 1999-2000	Percent change 2000-2001
Air	63,883,644	61,554,948	59,203,249	57,242,209	-3.65	-3.82	-3.31
Water	6,031,402	6,157,022	8,187,101	6,960,015	2.08	32.97	-14.99
Land	4,390,301	5,349,258	5,210,244	5,545,197	21.84	-2.60	6.43
Total	74,305,347	73,061,228	72,600,593	69,747,421	-1.67	-0.63	-3.93

The historical comparison suggested that the amount of TRI chemicals (excluding PBTs and vanadium and vanadium compounds) released to the environment from Virginia facilities has decreased by approximately 3.93% between 2000 and 2001. Continuing previous trends, the reduction of on-site air releases constitutes the largest portion of this reduction. According to the reported data, there was a 14.99% reduction in on-site releases to water, following a 32.97% increase in that quantity in 2000. The reported discharges to land during 2001 increased by 6.43 %. Part of this increase may be due to the reclassification of lead and lead compounds as PBTs and the concurrent reduction in the reporting threshold to 100 pounds.

Figure 11. Comparison of Total On-Site Releases to Media (Air, Land, and Water) 1998-2001 (from Section 5 of the Form R)

*Newly added chemicals in 2000 that were not reported previously were not counted for this data comparison.

The percent values on each bar represent the proportion of that year's total on-site releases. For example, the 86.0% on air for 1998 means that in 1998 air releases made up 86.0% of the total on-site releases for 1998.



Vanadium and vanadium compounds were required to be reported beginning in reporting year 2000; hence they were excluded from Figure 11. PBT chemicals that were not reported in previous years were also excluded from this chart.

In addition, since the principal difference between 2000 and 2001 data is the PBT classification and reporting threshold for lead and lead compounds, it is possible to compare data for TRI chemicals for these two years. Table 7 compares the data from summary data by type of release, transfer, and on-site management for TRI chemicals for those two years.

Table 7. Comparison Summary Data by Type of Release, Transfer, and On-site Management for TRI chemicals for 2000 and 2001 (from Table 1)

***Newly added chemicals in 2000 are counted for this data comparison.**

MANAGEMENT ACTIVITIES	YR 2000 (POUNDS)	YR 2001 (POUNDS)	CHANGES (POUNDS)	% CHANGE 2000 - 2001
ON-SITE RELEASES				
FUGITIVE AIR	6,721,349	7,588,107	866,758	12.90%
STACK AIR	52,488,288	49,662,145	(2,826,143)	-5.38%
AIR (TOTAL)	59,209,637	57,250,252	(1,959,385)	-3.31%
WATER	8,190,500	6,962,579	(1,227,921)	-14.99%
LAND	5,942,154	6,438,304	496,150	8.35%
UNDERGROUND INJECTION WELLS	0	5	5	
TOTAL	**73,342,291**	**70,651,140**	**(2,691,151)**	**-3.67%**
OFF-SITE TRANSFERS				
POTW	16,812,896	17,805,370	992,474	5.90%
OTHER OFF-SITE TRANSFERS (TOTAL)	47,195,880	51,639,923	4,444,043	9.42%
FOR RECYCLING	27,503,115	30,560,528	3,057,413	11.12%
FOR ENERGY RECOVERY	9,274,818	8,601,373	(673,445)	-7.26%
FOR OTHER TREATMENT	1,509,576	2,850,674	1,341,098	88.84%
FOR DISPOSAL	8,908,371	9,627,348	718,977	8.07%
TOTAL	**64,008,776**	**69,445,293**	**5,436,517**	**8.49%**
ON-SITE MANAGEMENT				
TREATED ON-SITE	96,484,398	145,665,713	49,181,315	50.97%
RECYCLED ON-SITE	122,010,829	94,875,493	(27,135,336)	-22.24%
ENERGY RECOVERY ON-SITE	43,585,093	27,825,485	(15,759,608)	-36.16%
TOTAL	**262,080,320**	**268,366,691**	**6,286,371**	**2.40%**

The data in this table confirms the reduction for 2000-2001 in on-site releases of TRI chemicals when newly added TRI chemicals are considered. The reduction in on-site releases is reported at 3.67%. The data also shows in increase of 8.49% in off-site transfers to POTWs and other off-site locations, and an increase of 2.40% in on-site management.

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Chapter 4 - TRI USES, LIMITATIONS, AND REPORTING CHANGES

USES OF TRI DATA

The Toxics Release Inventory provides the public with information concerning certain toxic chemicals manufactured, processed, or otherwise used at facilities, including the amounts released to the environment and managed as wastes. Responsible use of this information can enable the public to identify potential concerns, and to work with industry and government to reduce toxic chemical releases and the risks associated with them.

Because TRI covers all media (i.e., air, water, land), numerous groups within the Virginia Department of Environmental Quality also use TRI data to enhance programs in areas of permitting, compliance, waste tracking, emissions inventory, accident prevention, and educational outreach. TRI is used by the Pollution Prevention Program to target facilities for source reduction projects and to verify project results.

The Chesapeake Bay Program uses TRI data to establish goals and measure achievement of facilities in the watershed at reducing TRI chemical releases and off-site transfers for treatment and disposal. For specific goals see the 'Toxics 2000 Strategy" which is located on the Chesapeake Bay Program web site: http://www.chesapeakebay.net

Industry can use the data to obtain an overview of use and release of toxic chemicals, to identify and reduce costs associated with toxic waste, to identify promising areas of pollution prevention, to establish reduction targets, and to measure and document progress toward reduction goals. The public availability of the data has prompted many facilities to work with their communities to develop effective strategies for reducing environmental and human health risks that may result from toxic chemical releases.

LIMITATIONS OF TRI DATA

1. The TRI report contains reported information on the quantities of chemicals released and managed, not the public's exposure to or risk from the chemicals. Risk to human health by a chemical release depends on the toxicity of the chemical, how it disperses, reacts, or persists in the environment; and includes the quantity, concentration, and type of human exposure. Most TRI chemicals are broken down or detoxified, at various rates, when released into the environment while some may accumulate in an environmental medium or within organisms. Some chemicals may disperse rapidly when released into the environment; therefore more readily losing their toxic potency, and thus reducing their threat to public health and to the environment. However, those that do not get dispersed or broken down readily may retain their toxicity longer. Furthermore, chemicals appearing on the TRI are not weighted by their toxicity. For example, a pound of one substance may be more toxic or hazardous than 1000 pounds of another. Due to the limited nature of TRI data collected, readers are strongly discouraged from making any health or environmental risk/exposure assessments from the information presented. Many of the TRI chemical releases are permitted under other federal and state regulatory programs; therefore, data from these regulatory programs should provide additional information to better inform the citizens about their environment.

2. The TRI program captures only a portion of all toxic chemical releases in Virginia. It does not account for TRI chemicals from most non-manufacturing facilities, facilities with fewer than ten employees, facilities that do not meet the chemical quantity thresholds, other non-industrial sources, and transportation-related emissions. Included in the exemption are many treatment and disposal facilities that may discharge TRI chemicals during the treatment process or final disposition of the TRI chemicals.

3. The majority of facilities report TRI data based on estimates since the TRI program does not require that they monitor releases, only that they use best available data. Using different methods to estimate data can result in significant variability from one facility to another as well as from one year to the next.

4. Patterns of releases and other waste management activities can change dramatically from one year to the next due to factors such as production changes, sector economy, industrial practices, etc. Thus, it is important to recognize that current facility activities may be different from those reported for 2001.

5. The data currently collected for the TRI program provide limited information on the life cycle of chemicals used by facilities.

6. Beyond reporting on chemical releases and waste management activities, only limited and very general information on chemical storage and toxicity of chemicals is presented.

7. TRI is a constantly changing entity and with changes in reporting requirements being made over time, a meaningful comparison over years is difficult. The EPCRA statute gave U.S. EPA the authority to add chemicals to or remove (delist) chemicals from the TRI chemical list, to expand the industrial sectors subject to the reporting, or to lower the reporting threshold for certain chemicals. Therefore, at any one period, aside from the normal business fluctuation of the regulated industries, a change in reporting requirements can lead to a change in the volume or types of industry required to report.

CHANGES IN TRI REPORTING OVER THE YEARS (from most recent to oldest changes)

Final Rule - Lead and Lead Compounds; Lowering of Reporting Thresholds

On January 13, 2001, EPA published the final rule on lowering the reporting thresholds for lead and lead compounds (66 FR 4499, 40 CPR Part 372). The rule became effective April 17, 2001 and applied to TRI reports for reporting year 2001, which were due by July 1, 2002. The reporting thresholds were lowered to 100 pounds for lead (except when contained in steel, brass and bronze alloys) and lead compounds. Under previous reporting requirements facilities must report lead and lead compounds only if they manufactured or processed more than 25,000 pounds annually or otherwise used more than 10,000 pounds annually. Lead and lead compounds are of concern not only because they are persistent bioaccumulative toxic chemicals but also because they are especially toxic to children. Children absorb lead more readily than adults. Once exposed they can suffer from damage to the brain and central nervous system, slow growth, hyperactivity, and behavior and learning problems. Adults can suffer

difficulties during pregnancy, high blood pressure, nervous disorders, and memory and concentration problems.

Chromite Ore from the Transvaal Region of South Africa delisted for 2000

On May 11, 2001 both chromite ore mined in the Transvaal Region of South Africa, and the unreacted ore component of the chromite ore processing residue (COPR) were deleted from TRI reporting requirements. Therefore beginning with reporting year 2000 this particular chromite ore and the unreacted ore component of the COPR are no longer required to be reported under TRI.

*********Note that this delisting does not include any of the Cr(III) or Cr(VI) compounds that are also part of the COPR. This delisting only applies to the unreacted ore component of the COPR.*

Persistent Bioaccumulative Toxic Chemicals Rule added for 2000

EPA finalized a rule on October 29, 1999 (64 FR 58666) to add several persistent bioaccumulative toxic (PBT) chemicals to the TRI reportable chemical list, and to lower the reporting thresholds for a subset of the PBTs. Additionally, this rule added the non-PBT chemical category vanadium compounds and changed the qualifier for the non-PBT chemical vanadium. The new chemicals and thresholds were first reported in reporting year 2000. See "Major Changes in Reporting Requirements for 2000 TRI" (page 5) for further information on the new PBT chemical rule.

Phosphoric acid delisted for 1999

On June 27, 2000 phosphoric acid was deleted from the TRI reportable chemical list. Therefore beginning with reporting year 1999 it is no longer required to be reported under TRI.

Facility expansion

On May 1, 1997, the United States Environmental Protection Agency (USEPA) published a final rule (62 FR 23833; 40 CFR Part 372) expanding the industries required to report their toxic chemical releases and management under the EPCRA Section 313 - Toxic Release Inventory (TRI). Traditionally only the manufacturing sectors were required to file TRI reports. However, this rule expansion required seven non-manufacturing sectors to report. This regulation became effective for the 1998 calendar year activity reporting. The new industries were:

- Metal Mining (SIC 10, Except 1011, 1081, and 1094)
- Coal Mining (SIC 12, Except 1241)
- Electricity Utilities (SIC 4911, 4931, and 4939) - only facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce
- Treatment, Storage, and Disposal Facilities (TSDF) (SIC 4953 - only facilities regulated under the RCRA Subtitle C, 42 U.S.C. section 6921 et seq.)
- Chemical Distributors (SIC 5169)
- Petroleum Terminals and Bulk Storage Facilities (SIC 5171)
- Solvent Recovery Facilities (SIC 7389 - only facilities primarily engaged in solvent recovery services on a contract or fee basis)

EPA expanded the TRI reporting coverage with the intention to broaden and improve the "community right-to-know" public data base and to fill information gaps relating to the use and releases and other waste management activities of toxic chemicals by the existing covered facilities. According to EPA, the industry groups being covered under the expansion rule are responsible for the manufacturing, processing, otherwise use, releases, and/or other waste management of substantial quantities of TRI

chemicals, and are engaged in activities similar to or related to activities conducted by manufacturing sectors.

Chemicals removed for 1997

The two chemicals removed from the TRI chemical reporting list were:

2-bromo-2-nitropropane (bronopol)
2,6-dimethylphenol

New chemicals added for 1995

For 1995, 286 toxic chemicals and chemical categories were added to the TRI chemical list. This resulted in almost doubling the amount of listed TRI chemicals. See EPA website: http://www.epa.gov/tri/chemical/index.htm

U.S. Pollution Prevention Act rulemaking

In 1990, the Pollution Prevention Act (PPA) was passed by Congress requiring the addition of information on source reduction and toxic chemicals in waste. The change in program generated many comments (regarding definitions of waste stream, reportable recycling, and in-process recycling) from industry, environmental groups, and the public.

Chapter 5 - ADDITIONAL TRI INFORMATION

RECENT DEVELOPMENTS IN TRI REPORTING

On-Line Reporting to EPA TRI Data Collection Center to Occur for 2002 Reporting Year Due July 1, 2003.

EPA will be making on-line reporting and submittal of TRI reports possible for facilities that have reported the previous two years. Reporting packages to be mailed out to existing TRI facilities will contain instruction for on-line reporting and submittal of TRI report.

Denial of Petition - Overburden Exemption

On October 10, 2001, (67 FR 63060) EPA denied the petition submitted by the National Mining Association (NMA) to modify the EPCRA Section 313 definition of "overburden" to include both consolidated and unconsolidated material. As written in the regulation, only unconsolidated material is considered as overburden under the TRI program. EPA concluded that consolidated rock includes materials that often contain toxic chemicals above negligible amounts, often in significant quantity.

EPA Response to National Mining Association (NMA) on Extraction and Beneficiation Activities

On April 23, 2001, EPA responded to a guidance request from the National Mining Association on whether extraction and beneficiation activities at mining facilities constitute the “processing” or “manufacture” of toxic chemicals in ore.

> (i) The term “manufacture” means to produce, prepare, import, or compound a toxic chemical.
> (ii) The term “process” means the preparation of a toxic chemical, after its manufacture, for distribution in commerce.

EPA responded in the letter that they intend to initiate rulemaking to adopt a revised interpretation that will allocate extraction and beneficiation activities between these two statutory terms. However, until this rulemaking is completed, EPA will not definitively resolve whether a particular activity is best characterized as “manufacturing” or as “processing.” For now, individual facilities will remain responsible for determining whether their preparation of the toxic chemicals in the ore is better characterized as “manufacturing” or “processing.” EPA hopes to complete its rulemaking before the reporting deadline for the 2002 reporting year.

Stakeholder Dialogue for the TRI Program

EPA has undertaken a stakeholder dialogue for the TRI program. Given its community focus and the broad and varied uses of the TRI data, EPA would like to receive input from stakeholders.

The stakeholder dialogue contains two phases. Phase 1 focuses on the program objectives of timely public release of quality data. Specifically, EPA is seeking comment in the following areas:

- how to improve the compliance assistance provided by the TRI program, both at Headquarters and in the Regions, to aid the reporting community;

- how to streamline the collection and processing of the 90,000+ TRI forms that EPA receives annually; and
- how well the materials, including the context, documents and tools, that EPA develops for its annual public release of the TRI data supports their use and analysis of the data.

The Phase 2 of the stakeholder dialogue focuses on the program objectives of improving public understanding of the data and of the nature of facility releases. One key element will be clarifying the data elements on recycling and other waste management activities required by the Pollution Prevention Act

Proposed Diisononyl Phthalate Category (DINP)

EPA proposed a rule September 5, 2000 (65 FR 53681) to add a diisononyl phthalate (DINP) category to the list of toxic chemicals subject to the reporting requirements under the Emergency Planning and Community Right-To-Know Act (EPCRA) section 313. The proposed rule is based on DINP's carcinogenicity and liver, kidney, and developmental toxicity. EPA had extended the comment period until February 2, 2001. DINP is often used as a plasticizer to provide greater flexibility and softness to the final product, but it does have other uses.

SUPPLEMENTARY RESOURCES

Additional TRI data and individual facility information are available for the 1997, 1998, 1999, and 2000 reporting years. If you would like additional information on specific facilities or chemicals, please call the Virginia Department of Environmental Quality's SARA Title III Office at **(804) 698-4489** or direct your request in writing to the Virginia Department of Environmental Quality, SARA Title III Office, P.O. Box 10009, Richmond, VA 23240-0009.

1. TRI data can be accessed on the Internet through the Virginia Department of Environmental Quality SARA Title III Program web page: http://www.deq.state.va.us/sara3/313.html

2. The Form Rs submitted by facilities within the state are on file at the Virginia DEQ. Any inquiries about Form R information or the TRI program in Virginia should be made to Dona Huang by calling **(804) 698-4489.**

3. The Environmental Protection Agency's Toxic Release Reporting Center is the national repository for all TRI reports submitted to the EPA. The data is available on CD-ROM, magnetic tape, floppy disk, and microfiche. Copies of the reports were distributed to more than 3,000 libraries nationwide.

4. Any questions regarding the Emergency Planning and Community Right to Know Act (EPCRA) can be forwarded to EPA's toll free EPCRA call center. The phone numbers are: **(800) 424-9346, (703) 412-9810,** or **TDD (800) 553-7672, TDD (703) 412-3323.**

5. For reporting year 2002 the Automated TRI Reporting Software (ATRS) includes instructions for on-line reporting and submittal of report, the TRI Assistance Library (TRIAL). TRIAL is a Windows based help utility that contains policy and guidance documents to help facilities with TRI reporting. For more information visit EPA's website: http://www.epa.gov/tri/

6. The Right-to-Know Network (RTK NET) offers access to TRI data, along with health facts for each TRI chemical, searchable through the World Wide Web, Telenet, and dialup. RTK NET promotes pollution prevention, data analyses, and communication among individuals concerned about toxics use reduction. http://www.rtk.net/

7. ENVIROFACTS integrates data extracted from several EPA programs, including TRI. ENVIROFACTS allows users to search the database by facility name, its location, by chemical, or by SIC code. http://www.epa.gov/enviro/index_java.html

8. TRI Explorer is another tool provided by EPA, which allows users to search TRI data by county, facility, chemical, etc. http://www.epa.gov/triexplorer/

9. For information on the EPCRA Section 313 program and consolidated list of chemicals subject to EPCRA Section 313 and other federal programs, please visit EPA website: http://www.epa.gov/tri/

10. EPA's Risk Screening Environmental Indicators (RSEI) is a computer based model that uses TRI data for analysis of risk-related impacts of toxic chemical releases and transfers in the US. http://www.epa.gov/opptintr/env_ind/

EXPLANATION OF TERMS

coincidental manufacture – production of an EPCRA section 313 chemical as a byproduct or impurity as a result of the manufacture, processing, otherwise use, treatment, disposal or other waste management of other chemical substances.

energy recovery – recovery of useful energy from waste mainly through combustion of chemical waste.

facility – defined for the purposes of TRI reporting as all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person (entity).

fugitive (non-point) air releases – emissions to the air that are not conveyed through stacks, vents, ducts, pipes, or other confined air streams within the boundaries of a facility. Examples include equipment leaks from valves, pump seals, flanges, compressors, sampling connections, open-ended lines, and evaporative losses from surface impoundments and spills.

manufacture – to produce, prepare, import, or compound a toxic chemical.

off-site locations – locations outside the boundaries of a facility to which wastes are transported for treatment, energy recovery, recycling, or disposal.

otherwise use – any use of a toxic chemical at a facility which is not covered by the definitions of manufacture or process. This includes any activities in which a listed toxic chemical does not become intentionally incorporated into the final product for distribution in commerce. Examples of otherwise use include degreasers, solvents in paints that are applied to a product, chemicals used in water treatment, and refrigerants or coolants.

Persistent Bioaccumulative Toxic (PBT) chemical - a chemical that is stable for a long period of time, and builds up in the environment, particularly in food chains.

Publicly Owned Treatment Works (POTW) – a wastewater treatment facility which is owned by a unit of the government.

process – refers to the preparation of a listed toxic chemical after its manufacture, for distribution in commerce. Processing is usually the intentional incorporation of a toxic chemical into a product. It includes making mixtures, repackaging, and using a toxic chemical as a feedstock, raw material, or starting material for making another chemical.

recycle – the process of capturing a useful product from a waste stream. Solvent recovery, metals recovery, and acid regeneration are examples of recycling.

releases – refers to on-site discharges of TRI chemicals to the air, water, land, and disposal in underground injection wells (none in Virginia). They include permitted, accidental, and non-permitted discharges.

releases to air – see fugitive (non-point) air releases and stack (point source) air releases

releases to land – refers to land filling, surface impoundment, land treatment/application farming, or any other release of a toxic chemical to land within the boundaries of a facility.

releases to water – refers to discharging of chemicals to surface waters such as rivers, lakes, ponds, and streams within the boundaries of a facility.

source reduction/pollution prevention – activities that reduce the quantity and /or toxicity of wastes generated. Improved operation and maintenance, process and equipment modification, conservation practices, material substitution, product modification, and in-process recycling are examples of pollution prevention.

stack (point source) air releases – emissions to the air that are conveyed through stacks, vents, ducts, pipes, or other confined air streams within the boundaries of a facility. Examples include storage tank emissions and emissions from air pollution control equipment.

Standard Industrial Classification code (SIC code) – a four digit number code designated by the Federal Office of Management and Budget to describe the type of activity(s) at a facility. The first two numbers of the code define a major business sector, and the last two numbers define a facility's specialty within the major sector.

toxic – a substance that produces or causes a systemic damage to an organism.

transfers – refers to TRI chemicals sent off-site for energy recovery, recycling, treatment or disposal. They are reported as transfers to either Publicly Owned Treatment Works (POTWs) or other off-site transfers (non-POTWs) such as incinerators, landfills, other treatment, recycling, energy recovery, or disposal facilities not part of the reporting facility.

Appendix A-1: Historical comparisons of on-site releases prior to 1998

Since its inception, the TRI program has been expanding and evolving, providing more information to the public about the presence and release of toxic and hazardous chemicals in communities. In fact, over the past 12 years two major regulatory changes have occurred that make the direct historical comparison of releases from 1988 to 2001 difficult and inappropriate. During the early years of the program there were no major reporting changes. From 1988 until 1994 the consistency between reporting sectors and chemicals made it easier to compare data year to year. The first major change in reporting requirements was the addition of 286 chemicals and chemical categories to the TRI list beginning with reporting year 1995. The addition of chemicals in reporting year 1995 created a new baseline for TRI comparisons from that point forward, a comparison that represented similar reporting sectors and similar chemicals and chemical categories. The second major change was the inclusion of seven non-manufacturing sectors (sectors that had never previously reported to TRI) to the TRI facility coverage beginning in the 1998 TRI reporting year. With this most recent change 1998 became the new baseline from which to make comparisons. As is demonstrated in figures A-1 and A-2 the reported total on-site releases to media decreased significantly since the beginning of the TRI program in 1988. Figure A-1 shows historical evaluations of on-site releases from 1988 to 1994, and covers years with similar reporting requirements. Figure A-2 shows the comparison between 1995 and 1997 from the traditional manufacturing sectors.

Figure A-1. Comparison of Total On-Site Releases to Media (Air, Land, and Water) from Manufacturing Sectors, 1988 -1994 (from Section 5 of the Form R)

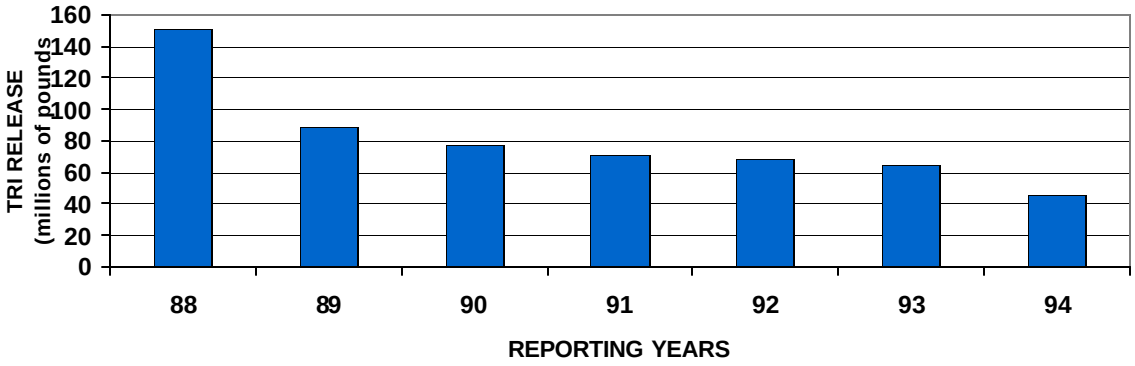
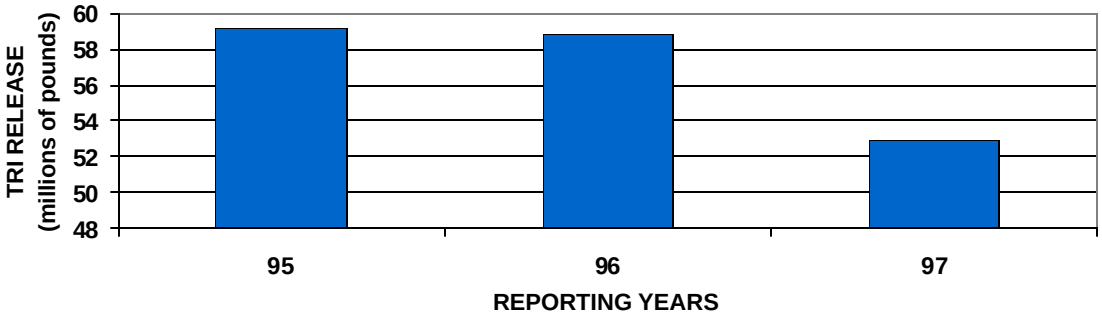


Figure A-2. Comparison of Total On-Site Releases to Media (Air, Land, and Water) from Manufacturing Sectors, 1995 -1997 (from Section 5 of the Form R)



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APPENDIX A-2: 2001 SUMMARY OF FACILITIES CHEMICAL RELEASES AND TRANSFERS

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